

Evidence-based physiotherapeutic management for knee osteoarthritis: A knowledge translation study

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the requirements for the degree of
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DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my original work and that I have not previously submitted it, in its entirety or in part, at any university for a degree.

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ABSTRACT

Background: Evidence for the effectiveness of physiotherapeutic interventions in the management of knee osteoarthritis (OA) is synthesised in the current clinical guidelines (CGs), providing clinicians with readily accessible and interpretable practice guidelines. However, CGs are often not specific to the local context of the target users, therefore hindering successful implementation of evidence into clinical practice. Formulating succinct and composite recommendations by synthesising the current CGs reporting on the evidence-based (EB) management of knee OA may assure contextual relevance and facilitate implementation of evidence into clinical practice. In addition, multifaceted interventions, such as evidence-based practice (EBP) workshops, are also postulated to promote the implementation of guideline recommendations, thereby enhancing clinical outcomes.

Objectives: The primary objectives of this study were to: 1) describe the range of EB physiotherapeutic interventions in the management of knee OA as documented in the current CGs; and 2) develop composite clinical recommendations for a specific group of users working in Jerusalem. A secondary study objective was to ascertain the effect of translating the knowledge through a specifically-designed EBP workshop on the uptake of knowledge and implementation of EBP into clinical practice by physiotherapists working in Jerusalem. The EBP workshop was aimed at educating physiotherapists about the EB physiotherapeutic techniques for knee OA management.

Study design: Two studies were conducted. A systematic review (SR) into EB clinical guidelines was conducted to describe and synthesise the available evidence and formulate composite recommendations for knee OA. The results of the SR were used to design an EBP workshop aimed at educating physiotherapists about EB physiotherapeutic techniques for treating knee OA patients. A pre-post quasi-experimental design was then

conducted to assess the effect of this EBP workshop on the uptake and implementation of EBP into clinical practice amongst public sector physiotherapists working in Jerusalem.

Methodology for quasi experimental study: Physiotherapists who regularly treat knee OA patients were recruited from a list of members registered with the Palestinian Physiotherapy Association Jerusalem. A three-month retrospective audit (initial audit) of knee OA patients' physiotherapy records kept by the participating physiotherapists was conducted to establish current management patterns. EB strategies for knee OA was presented to the participating physiotherapists during a one-day workshop. A second audit of physiotherapy records was conducted three months after the EBP workshop to establish changes in the selection of physiotherapeutic management techniques for knee OA.

Results: The initial audit revealed that the participating physiotherapists utilized one high EB modality namely, exercises, as a core management strategy in knee OA, but did not frequently implement other high EB modalities such as self-management and weight-loss programs. Following the EBP workshop, a statistically significant increase ($p=0.008$) in the implementation of weight-loss and self-management strategies in the management of knee OA was noted. Conversely, a statistically significant decrease was noticed in using patellar taping (low EB modality) in the management of knee OA ($p=0.04$). No significant changes were noticed in the utilization of other physiotherapy modalities supported by weak or modest EB recommendations.

Conclusion: The study concluded that physiotherapists inherently prescribed exercise as a core management strategy for knee OA. Modalities supported by modest levels of evidence were used as adjunct treatments. The EBP workshop facilitated the increased application of high EB modalities such as weight-loss and self-management programs. The results of this study illustrate that an EBP workshop may be effective in promoting the implementation of EB physiotherapeutic modalities in the management of knee OA. However, larger studies with longer follow-up periods are required.

Key words: *knee osteoarthritis, physiotherapy, evidence-based practice, clinical guidelines, management*

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CHAPTER 1

Introduction

Osteoarthritis (OA) most commonly affects the knee joint (Zhang and Jordan, 2010). Knee OA is defined as a clinical syndrome of joint pain accompanied by varying degrees of functional limitation and reduced quality of life (The Royal Australian College of General Practitioners (RACGP), 2009). The prevalence of symptomatic knee OA in developed countries is estimated at five per cent for adults between the ages of 26 and 45 years; 17% for adults above the age of 45 years; and 12.1% for adults over the age of 60 years (American Academy of Orthopaedic Surgeons (AAOS), 2008). In the United States (US), 9.3 million adults suffer from symptomatic knee OA (National Collaborating Centre for Chronic Conditions (NCCCC), 2008).

Knee OA has a significant impact on function and quality of life. Recurrent knee pain is the primary symptom affecting crucial functional activities, including walking (Zhang and Jordan, 2010). Other knee OA-associated symptoms such as stiffness and muscle weakness further impairs function and has an impact on societal, recreational and occupation-related activities (Walsh and Hurley, 2008). Management of chronic knee OA symptoms primarily includes pharmacological, physiotherapeutic and surgical interventions (RACGP, 2009).

The economic cost of knee OA management is high (Altman, 2010). Prescription of non-steroidal anti-inflammatory drugs (NSAIDs) cost the US approximately \$2 billion per annum (NCCCC, 2008). In the United Kingdom (UK), there were 114,500 hospital admissions for knee OA over a one year period (Arthritis Research Campaign, 2002). In 2000, over 35,000 knee replacements were performed at a cost of £405 million. The economic burden knee OA management places on society, healthcare systems and

industry therefore warrants implementing cost-effective interventions, particularly in countries with already constrained resources (NCCCC, 2008).

Physiotherapy for knee OA is proposed as a relatively cost-effective mode of management (Jordan *et al.*, 2003). However, previous surveys into the physiotherapy management for knee OA indicated significant variability in service delivery (Walsh and Hurley, 2008). A wide range of passive and active physiotherapy interventions such as self-management education programs, physical exercise, weight-loss programs, thermotherapy, electrotherapy, manual therapy, massage, acupuncture, bracing and assistive devices are applied in the management of knee OA. A recent study conducted in the UK concluded that physiotherapists often use management modalities for which there is low-level or no evidence base (Walsh and Hurley, 2008). Therefore, physiotherapists' selection of appropriate evidenced-based (EB) techniques to manage knee OA should be addressed.

Evidenced-based clinical guidelines (EBCGs) aim to optimise management and reduce variability in healthcare (Prior *et al.*, 2008). The appropriateness of EBCGs to the local context is however, a key facilitator for guideline implementation into clinical practice. The EBCGs should provide user-friendly recommendations for specific clinical questions relevant to the needs, priorities, legislation, policies and resources of the targeted setting (van der Wees *et al.*, 2008; Hillier *et al.*, 2011). This will ensure the efficiency, applicability and implementation of the recommendations without undermining their validity (ADAPTE, 2007). Developing recommendations for the target group and experts will therefore enhance the implementation of the EBCGs into clinical practice (Francke *et al.*, 2008).

A systematic review into existing EBCGs for knee OA management indicated that self-management education programs, exercise therapy and weight-loss programs should be considered as best evidence-based practice (EBP) (Chapter 2). The findings of this review indicated that the existing EBCGs for knee OA management were primarily developed in first world economies including the US, UK and Australia. Currently there

are no EBCGs for knee OA physiotherapy management for the Middle East. Furthermore, there is a lack of published evidence into translation research which aim to ascertain the effect of strategies used to facilitate the implementation of EB into clinical practice. Adaptation or synthesis of existing EBCGs is therefore required to ensure relevance to the local Middle East context.

The objectives of the following study were to describe the range of EB physiotherapeutic interventions incorporated in the management of knee OA patients as documented in EBCGs for knee OA physiotherapy management and then to develop composite clinical recommendations for implementation of EBP into a Middle Eastern clinical setting. The second objective was to ascertain the effect of an EBP workshop aimed at translating the knowledge to physiotherapists about the uptake of EB physiotherapeutic recommendations in the management of knee OA patients.

Figure 1.1 depicts the outline of the thesis.

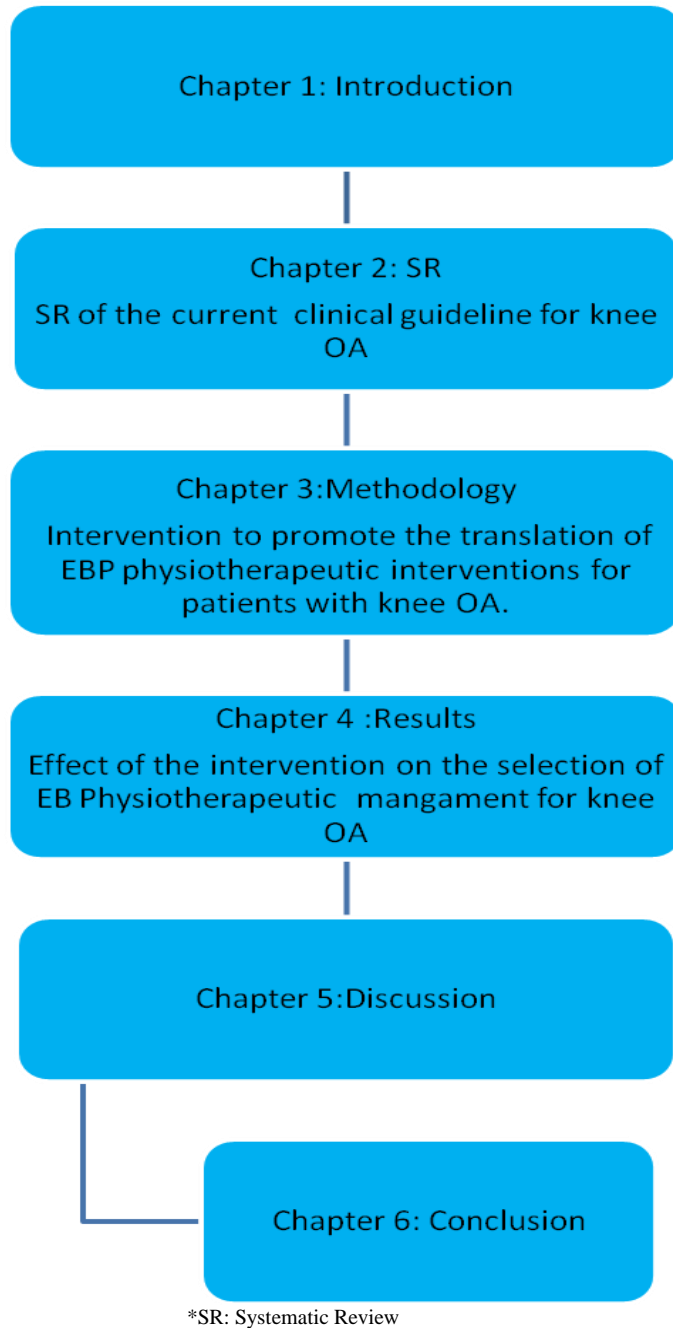


Figure 1.1 *Thesis outline flow chart*

CHAPTER 2

Physiotherapy interventions for patients with knee osteoarthritis: A systematic review of the current guidelines

2.1 Introduction

Osteoarthritis (OA) is the most common disease affecting knee joint (Roddy *et al.*, 2005). The knee is a load-bearing, synovial joint that is prone to injury and pathology throughout a person's lifespan (Zhang and Jordan, 2010). Clinical symptoms relating to knee OA do not always correspond with radiographic changes. Therefore, the exact incidence and prevalence of OA is difficult to determine and symptomatic patients may represent a small proportion of knee OA sufferers (Zhang, 2010).

The management of knee OA typically comprises of pharmacological, non-pharmacological or surgical interventions (Royal Australian Collage of General Practitioners (RACGP), 2009; American Association of Orthopaedic Surgeons (AAOS), 2008). Physiotherapeutic interventions are a non-pharmacological form of treatment. A wide range of passive and active physiotherapeutic interventions such as self-management education programs, physical exercise, weight-loss programs, thermotherapy, electrotherapy, manual therapy, massage, acupuncture, bracing and assistive devices are commonly used to treat patients with knee OA. The reported positive cost-benefit ratios and reduced side-effects linked to physiotherapeutic interventions for knee OA compared to pharmacological and surgical interventions support the use of physiotherapy as first-line management for knee OA (Osteoarthritis Research Society International (OARSI), 2008).

Evidence for the effectiveness of physiotherapeutic interventions in knee OA is synthesised in the currently available published clinical guidelines (CGs) (AAOS, 2008;

RACGP, 2009; National Institute for Health and Clinical Excellence (NICE), 2008; OARSI, 2008). CGs provide readily accessible, time-efficient and interpretable references for clinicians, as they summarise available literature to answer a range of clinical questions (van der Wees *et al.*, 2008). However, CGs should be specific to the local context of the target users. Evidence-based clinical guidelines (EBCGs) often differ with respect to the guideline development methodology, evidence grading and methods used to formulate recommendations (Hillier *et al.*, 2011). Selecting the most appropriate EBCGs for a specific context may thus be challenging to clinicians and may constrain the implementation of evidence into clinical practice. Synthesizing EBCGs may therefore assist clinicians in understanding the comprehensive evidence base for a specific intervention and provide succinct, composite recommendations which may facilitate the implementation of evidence into practice (van der Wees *et al.* 2008).

The primary aims of this review were to describe the range of EB physiotherapeutic interventions in the management of knee OA as documented in current EBCGs for knee OA physiotherapy management and to develop composite EB physiotherapy clinical recommendations for knee OA management relevant to the Middle East clinical setting.

2.2 Review objectives

The primary objectives of this review were:

1. To describe knee OA physiotherapy management as indicated in current EBCGs.
2. To review the evidence grading systems applied in EBCGs and ascertain the level of evidence for the physiotherapeutic interventions used in the management of knee OA.
3. To assess the methodological quality of the currently available EBCGs for knee OA management.
4. To synthesis the currently available evidence into composite clinical recommendations for the EB physiotherapeutic management of knee OA in Jerusalem (Middle East).

2.3 Abbreviations/Acronyms

AAOS	American Association of Orthopaedic Surgeons
ADL	Activity of Daily Living
BMI	Body Mass Index
CI	Confidence Interval
CGs	Clinical Guidelines
EB	Evidence-based
EBP	Evidence-based Practice
EBCGs	Evidence-based Clinical Guidelines
ES	Effect Size
LASER	Light Amplification by Stimulated Emission of Radiation
LoE	Level of Evidence
MA	Meta-Analysis
MCII	Minimal Clinically Important Improvement
NHMRC	National Health and Medical Research Council (Australia)
RACGP	Royal Australian Collage of General Practitioners
NHS	National Health Service (England and Wales)
NICE	National Institute for Health and Clinical Excellence (UK)
NS	Not Significant
OA	Osteoarthritis
OARSI	Osteoarthritis Research Society International
PEMF	Pulsed Electromagnetic Field
RCTs	Randomised Controlled Trials
ROM	Range of Motion
SMD	Standard Mean Deviation
SMEPs	Self -Management Education Programs
SOR	Strength of Recommendation
SR	Systematic Review
SWD	Short-Wave Diathermy
TENS	Transcutaneous Electrical Nerve Stimulation
US	Ultrasound
VAS	Visual Analogue Scale
WOMAC	Western Ontario and McMaster Osteoarthritis Index

2.4 Methods

This section describes the systematic procedure in which guidelines were retrieved and assessed, the data sources which were used and the inclusion criteria that were set. The search strategy used in this review, the data extraction and review process is also explained. Finally, the evaluation process of the included guidelines in terms of methodological appraisal and level of evidence (LoE) are defined.

2.4.1 Inclusion criteria

CGs published between January 2005 and June 2010 which examined the physiotherapy management of knee OA in male and female adults, aged 18 years and older were included. CGs had to be published in the English language. Full-text versions of all eligible CGs were required.

2.4.2 Search strategy

Two independent reviewers searched five electronic databases and seven CGs web sources. A systematic search in the available databases and the available CGs websites were accessed via the Stellenbosch University library and the internet. The search aimed to identify the EBCGs for the physiotherapeutic management of knee OA published between January 2005 and June 2010 using appropriate key search terms. The key search terms included: '*physiotherapy*', '*knee osteoarthritis*' and '*guideline*'. The reviewers searched *PUBMED*, *PEDro*, *TRIP* and *Science Direct*. In *PEDro*, the searches were restricted to terms in the record title, abstract or key words.

The following CGs websites were also searched: *The Medical Journal of Australia* (www.mja.com.au), *National Institute of Health and Clinical Excellence* (www.nice.org.uk), *National Guidelines Clearing House* (www.guideline.gov), *Canadian Medical Association* (www.cma.ca), *Scottish Intercollegiate Guidelines Network* (www.sign.ac.uk), *Clinical Practice Guidelines and Protocols in British Colombia* (www.bcguidelines.ca), *National Library for Health* (www.library.nhs.uk), *Florida Agency for Health Care Administration* (www.ahca.myflorida.com).

The following limits were applied to the databases and the CGs websites: *Human, English, and date of publication (2005 to 2010)*. For selection purposes, two independent reviewers selected the eligible CGs by firstly, screening all the possible titles; secondly, reading the abstract; and finally, reading the full-text CGs. The search procedure is illustrated in figure 2.1.

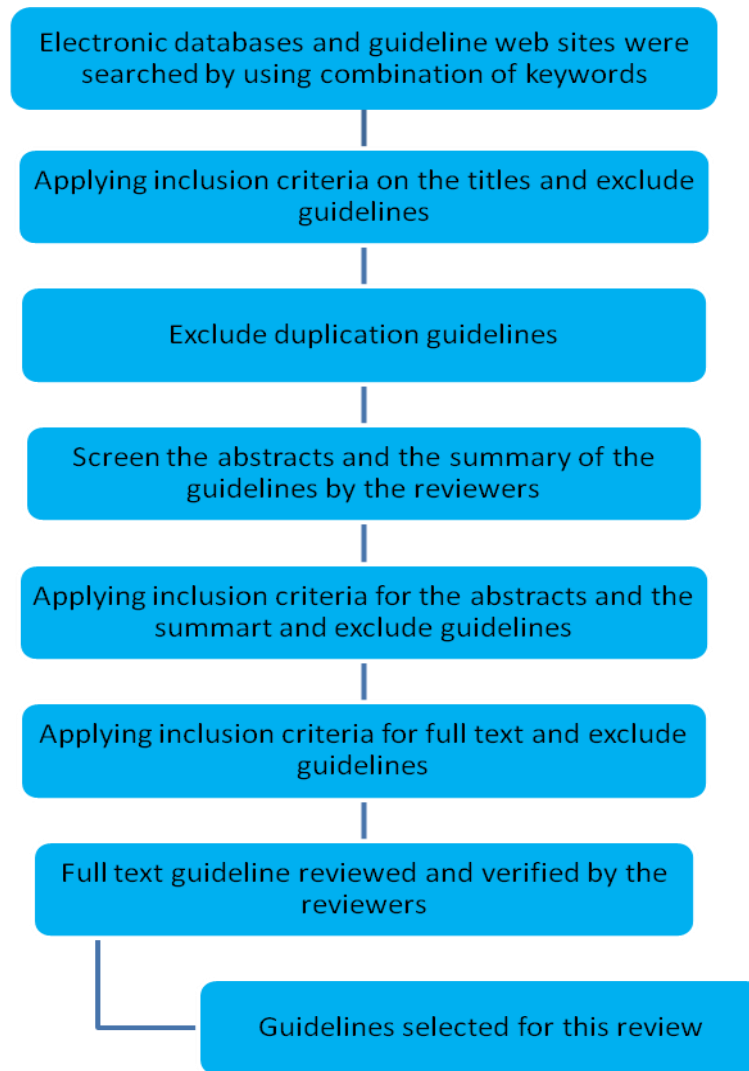


Figure 2.1 Guideline selection procedure flow chart

2.4.3 Data extraction and synthesis

One reviewer extracted data from the included CGs. The following information was extracted: *author, title, publication year, country, development team, instruments and scales for recommendations, grading and evidence scoring and the recommendations*, and were entered into a purpose-built Microsoft Excel (MS) worksheet.

2.4.4 Methodological appraisal

Five independent reviewers assessed the selected CGs for quality by using the AGREE instrument. The AGREE instrument consists of 23 key items organised in six domains. Each domain addresses a separate entity of the guideline quality. The six domains score the quality of the CGs by using a Likert scale ranging from strongly disagree (0) to strongly agree (4) (AAOS, 2008). The six domain scores were then standardized into percentage scores of each domain.

2.4.5 Methods to synthesis recommendations

A three-step approach was undertaken to synthesise the available recommendations in the CGs:

- *Step 1: Evidence base for synthesised recommendations*

To grade the evidence of the CGs, the primary and secondary research cited in each guideline for a specific recommendation was extracted into a MS worksheet (Appendix 1) to compare the differences in supporting evidence for a specific intervention across guidelines. The evidence to support each of the new recommendations for this project was then re-evaluated in terms of the strength of the body of evidence according to Australia's National Health and Medical Research Council (NHMRC) Evidence Hierarchy (Appendices 2 and 3).

- *Step 2: Grading of recommendations*

Each new recommendation was formulated according to the new guideline recommendation matrix developed in line with the NHMRC. The NHMRC matrix considers five key components: *the evidence base, consistency, clinical impact,*

generalisability and applicability. For the purpose of this project, these key components were evaluated as indicated in Table 2.1.

- *Step 3: Wording of recommendations*

A collaborative approach was undertaken with an international expert in CG writing to combine the wording of the recommendations presented in each guideline. These synthesised recommendations were then re-organised into core recommendations and strategies, in an attempt to reduce the overall number of recommendations and make them more practical for clinicians to implement.

Table 2.1 Definition of key components adapted from NHMRC

Key component	Definition
Evidence base	A: One or more level I or several level II studies
	B: One or two Level II studies or SR/several Level III studies
	C: One or two Level III studies or Level I or II studies
	D: Level IV studies or Level I to III studies/SRs
Consistency	A: Recommendations in all guidelines consistent
	B: Recommendations in most guidelines consistent and inconsistency can be explained
	C: Some inconsistency, reflecting genuine uncertainty around question
	D: Evidence is inconsistent
	Not applicable (N/A)
Clinical impact	A: Effect Size considered (large effect size $d \geq 0.8$)
	B: Effect Size considered (moderate effect size $d \leq 0.5$)
	C: Effect Size considered (Small effect size $d \geq 0.2$)
	D: Not Reported
Generalisability	A: Evidence directly generalisable to target population
	B: Evidence directly generalisable to target population with some caveats
	C: Evidence not directly generalisable to the target population but could be sensibly applied
	D: Evidence not directly generalisable to target population and hard to judge whether it is sensible to apply
Applicability	A: Evidence directly applicable to Middle East healthcare context
	B: Evidence applicable to Middle East healthcare context with few caveats
	C: Evidence probably applicable to Middle East healthcare context with some caveats
	D: Evidence not applicable to Middle East healthcare context

2.5 Results

2.5.1 Search results

The comprehensive search for CGs into the physiotherapeutic management of knee OA yielded **592** initial hits. The results of the search are illustrated in figure 2.2.

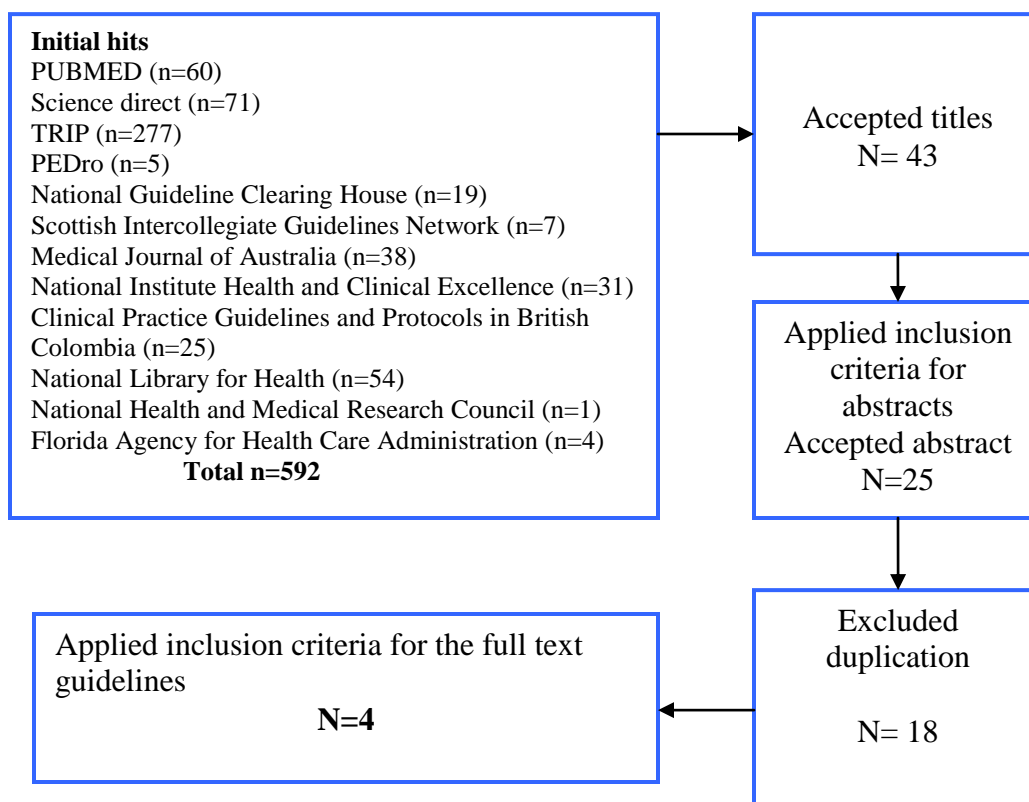


Figure 2.2 Flow chart demonstrating the guideline search and selection process

Four CGs were included in this review (*Clinical Practice Guideline on the Treatment of Osteoarthritis of the Knee (Non-Arthroplasty)* American Academy of Orthopaedic Surgeons (AAOS, 2008); *The Guideline for the Non-surgical Management of Hip and Knee Osteoarthritis* (RACGP, 2009); *Osteoarthritis Research Society International (OARSI, 2008-2010)*; *Recommendations For The Management Of Hip and Knee Osteoarthritis 2008 (parts I, II and III) 2010*; *Osteoarthritis: The National Clinical*

Guideline For Care and Management in Adults (NICE, 2008). These guidelines were conducted in USA (one guideline), UK (two guidelines), and Australia (one guideline).

At the end of the selection process, two guidelines were excluded from this review, namely *Osteoarthritis of Knees, 2007* and *Osteoarthritis in peripheral joints-diagnosis and treatment, 2008*). The *Osteoarthritis of Knees, 2007* was excluded since data related to the methods used to collect the evidence, data sources, data analysis and formulation of recommendation processes were not documented in this guideline and a full-text version of the guideline was unavailable. *Osteoarthritis in peripheral joints-diagnosis and treatment, 2008* was considered an advisory protocol for health professionals to assess, diagnose and treat patients with knee OA and was therefore excluded from this review.

2.5.2 Description of the eligible guidelines

A summary of the eligible guidelines is presented in Table 2.2. The following section provides brief information related to each guideline:

- *Treatment of osteoarthritis of the knee (non-arthroplasty)(2008)*

This guideline was adopted by the AAOS. Recommendations in this guideline cover pharmacological and non-pharmacological treatments up to but excluding knee replacement. Twenty-two recommendations were documented. The guideline was available in a full-text version.

- *The Guideline for the non-surgical management of Hip and Knee Osteoarthritis (2009)*

This guideline was published by The Royal Australian College of General Practitioners and approved by the NHMRC. This guideline provided recommendations related to the non-surgical management of hip and knee OA.

- *Osteoarthritis Research Society International (OARSI) Recommendations for the Management of Hip and Knee Osteoarthritis (2008-2010)*

Recommendations provided in this guideline are based on three publications of the OARSI group. The first part was a critical appraisal of existing treatment guidelines and a systematic review of current research evidence. The second part was the OARSI EB

expert consensus guidelines. The final publication was based on changes in evidence following a systematic cumulative update of research published between January 2009 and January 2010. Recommendations covered the pharmacological, non-pharmacological and surgical management for hip and knee OA.

- *Osteoarthritis: The National Clinical Guideline for Care and Management in Adults (2008)*

This guideline was published by the Royal College of Physicians and funded by NICE. This guideline provided recommendations on pharmacological and non-pharmacological interventions as well as referral criteria for surgery in the management of OA. In addition, recommendations relating to the evidence for the cost-effectiveness of the interventions were included.

Table 2.2 Summary of Clinical Guidelines

Title	Author	Year	Country	Condition/disease	Target users	Guideline category
AAOS (2008)	American Academy of Orthopaedic Surgeons	2008	USA	Knee OA	Orthopaedic surgeons, All qualified physician managing patient with knee OA	Management
RACGP (2009)	The royal Australian College of General Practitioner	2009	Australia	Hip and Knee OA	GPs Patients	Management
OARSI (2008)	Royal College of Physicians	2008	UK	OA	All healthcare professionals, people with OA and their parents and cares ,patient support group, commission organizations and services providers	Management
NICE (2008)	Osteoarthritis Research Society International	2008	UK	Hip and Knee OA	Physicians Allied health care professionals patients	Management

2.5.3 Methodological quality of included guidelines

The result of the methodological assessment of the eligible guidelines using the AGREE tool is summarized in Table 2.3.

Table 2.3 Composite AGREE results for each domain (%)

Guideline	Scope & purpose	Stakeholder development	Rigour of development	Clarity & presentation	Applicability	Editorial independence
AAOS (2008)	60	51.7	87.6	76.7	17.8	50
RACGP (2009)	73.3	56.7	87.6	78.3	37.8	76.7
OARSI (2008)	68.9	63.3	77.1	71.7	66.7	56.7
NICE (2008)	77.8	78.3	74.3	65	64.4	40
Mean	70	62.5	81.7	72.9	46.7	55.8
SD	7.6	11.6	7	6	23.3	15.5

2.5.4 Evidence hierarchies applied to included guidelines

The process for grading the recommendations based on the collected evidence varies between the included guidelines. All the eligible guidelines used simple, clear models for scoring the LoE and the detailed systems are summarized in Table 2.4.

Table 2.4 Hierarchy of evidence

Guideline	Hierarchy of evidence
AAOS (2008)	<p>Level I: high quality RCT with statistically significant difference or no statistically difference but narrow confidence intervals SR of Level I RCTs (study results were homogenous)</p> <p>Level II: lesser quality RCT(e.g., <80% follow up, no blinding or improper randomization) , prospective comparative study. SR of Level II studies or Level I studies with inconsistent results.</p> <p>Level III: case control studies, retrospective comparative studies. SR of Level III studies.</p> <p>Level IV: case series.</p> <p>Level V: expert opinion.</p>
RACGP (2009)	<p>I: Evidence obtained from a systematic review of all relevant randomised controlled trials.</p> <p>II: Evidence obtained from at least one properly designed randomised controlled trial.</p> <p>III–1: Evidence obtained from well-designed pseudo randomised controlled trials (alternate allocation or some other method).</p> <p>III–2: Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case control studies, or interrupted time series with a control group.</p> <p>III–3: Evidence obtained from comparative studies with historical control, two or more single arm studies, or interrupted time series without a parallel control group.</p> <p>IV: Evidence obtained from case series, either post-test or pre-test and post-test.</p>
OARSI (2008)	<p>Ia: Meta-analysis of Randomized Controlled Trials</p> <p>Ib :At least one Randomized Controlled Trial</p> <p>IIa :At least one well-designed controlled study, but without randomisation</p> <p>IIb: At least one well-designed quasi-experimental study</p> <p>III: At least one non-experimental descriptive study (e.g., comparative, correlation or case controlled study)</p> <p>IV: Expert committee reports, opinions and/or experience of respected authorities</p>
NICE (2008)	<p>1++ High-quality meta-analyses (MA), systematic reviews of RCTs, or RCTs with a very low risk of bias.</p> <p>1+ Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias.</p> <p>1– Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias.*</p> <p>2++ High-quality systematic reviews of case-control or cohort studies. High-quality case-control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal.</p> <p>2+ Well-conducted case-control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal.</p> <p>2– Case-control or cohort studies with a high risk of confounding, bias or chance and a significant risk that the relationship is not causal.</p> <p>3 Non-analytic studies (for example case reports, case series).</p> <p>4 Expert opinion, formal consensus.</p>

2.5.5 Recommendation grading

Three of the included guidelines reported the method for grading the recommendations (AAOS, 2008; OARSI, 2008; RACGP, 2009) (Table 2.5). OARSI (2008) used the Strength of Recommendation (SOR) for propositions related to each intervention. SOR was based on the opinions of the guideline development group and the clinical expertise of the members on the guideline committee. The guideline development committee members were asked to indicate the SOR of each recommendation by using a 100 mm Visual Analogue Scale (VAS). The results of the SOR were expressed as means and standard errors (SE) with 95% of confidence intervals (CI) (RACGP, 2009).

Table 2.5 Recommendation grading methods

Guideline	Recommendations grading
AAOS (2008)	<p>A: Good evidence (Level I Studies with consistent finding) for or against recommending intervention.</p> <p>B: Fair evidence (Level II or III Studies with consistent findings) for or against recommending intervention.</p> <p>C: Poor quality evidence (Level IV or V) for or against recommending intervention.</p> <p>I: There is insufficient or conflicting evidence not allowing a recommendation for or against intervention.</p>
RACGP (2009)	<p>A: Excellent evidence – body of evidence can be trusted to guide practice</p> <p>B: Good evidence – body of evidence can be trusted to guide practice in most situations</p> <p>C :Some evidence – body of evidence provides some support for recommendation(s) but care should be taken in its application</p> <p>D: Weak evidence – body of evidence is weak and recommendation must be applied with caution</p>
OARSI (2008)	<p>The GRADE Working Group. Grading quality of evidence and strength of recommendations (SOR)</p> <p>Delphi exercise</p>
NICE (2008)	No grading system used

Two of the included guidelines considered the Minimal Clinically Improvement Importance (MCII) to address some of the recommendations (AAOS, 2008; OARSI,

2008). AAOS provided full MCII descriptive terms used in the guideline and the conditions for the use of each term. These terms are provided in Table 2.6.

Table 2.6 Description of minimal clinically improvement importance terms

Descriptive term	Condition for Use
Clinically Important	Statistically significant and lower confidence limit > MCII
Possibly Clinically Important	Statistically significant and confidence intervals contain the MCII
No Clinically Important	Statistically significant and upper confidence limit < MCII
Negative	Not statistically significant and upper confidence limit < MCII
Inconclusive	Not statistically significant but confidence intervals contain the MCII

2.5.6 Physiotherapy interventions

Recommendations relating to EB physiotherapeutic interventions utilized in the management of knee OA were collected and are reported in the following section. The physiotherapeutic interventions included in the included guidelines were:

- *Acupuncture*
- *Braces and assistive devices*
- *Electrotherapy*
- *Land and aquatic-based exercises*
- *Manual therapy*
- *Massage*
- *Multimodal physical therapy*
- *Patellar taping*
- *Self-management education programs (SMEPs)*
- *Thermotherapy*
- *Weight-loss programs*

The evidence for the effect of each modality is discussed below.

2.5.6.1 Self-management education programs (SMEPs)

Recommendations relating to SMEPs were documented in all the eligible guidelines (Table 2.7). Evidence for the use of SMEPs in the management of knee OA was collected from two meta-analyses (MA) (Warsi *et al.*, 2004; Chodosh *et al.*, 2006), one systematic review (SR) (Devos-Comby *et al.*, 2006) and six randomized controlled trials (RCTs) (Nunez *et al.*, 2006; Buszewicz *et al.*, 2006; Heuts *et al.*, 2005; Victor and Triggs, 2005; Maisiak *et al.*, 1996; Calfas *et al.*, 1992).

Table 2.7 SMEPs recommendations

Guideline	Recommendation	ES
AAOS (2008)	We suggest patients with symptomatic OA of the knee be encouraged to participate in self-management educational programs, such as those conducted by the Arthritis Foundation and incorporate activity modifications into their lifestyles.	Pain d= 0.06 (0.02-0.10)
RACGP (2009)	There is some evidence to support GPs recommending self-management education programs for treatment of OA of the hip and knee.	ES=0.19
OARSI (2008)	All patients with hip and knee OA should be given information access and education about the objectives of treatment and the importance of changes in lifestyle, exercise, pacing of activities, weight reduction, and other measures to unload the damaged joint(s). The initial focus should be on self-help and patient-driven treatments rather than on passive therapies delivered by health professionals. Subsequently emphasis should be placed on encouraging adherence to the regimen of non-pharmacological therapy	Pain d= 0.06 (0.02-0.10)
NICE (2008)	Healthcare professionals should offer all people with clinically symptomatic OA advice on the following core treatments: -access to appropriate information -activity and exercise -interventions to effect weight loss if overweight or obese	

The body of evidence matrix is provided in table 2.8.

Table 2.8 Body-of-evidence matrix for self-management programs (SMEPs)

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
SMEPs	A	A	C	A	A

The composite recommendation for SMEPs in the EB physiotherapeutic management of knee OA is as follows:

Composite recommendation 1

There is strong evidence to support the use of SMEPs in the management of knee OA

Strategy 1: SMEPs should be administered by recognized service provider

Strategy 2: SMEPs should address self-help, patient-driven, lifestyle changes, exercise and activity bracing

Strategy 3: In addition, advice should be provided on pharmacological and non-pharmacological therapies

2.5.6.2 Land-based exercise

- Aerobic exercises

Good evidence supporting aerobic exercises as core management for patients with knee OA was reported in the included guideline recommendations. The recommendations, LoE and grade of recommendations are summarised in Table 2.9. All of the included guidelines provided evidence based on large, well-conducted SRs (Roddy et al., 2005) consisting of 13 RCTs which compared aerobic exercises to a control.

- Strengthening exercises

All the guidelines discussed the effect of strengthening exercises as part of land-based exercise programs for knee OA. Only one guideline (AAOS, 2008) discussed

strengthening exercises separately and included specific recommendations. Table 2.9 summarizes the recommendations related to strengthening exercises, LoE and the grade of recommendation. One good-quality MA was documented in the four included guidelines and reported that a statistical significant effect due to quadriceps strengthening exercises on reducing pain and functional disability, compared to education and lifestyle advice, telephone support, no intervention and sham intervention, was found. In this MA, the major shortcoming was that the analysis combined studies that measured pain and disability in different ways. Thus, it is impossible to determine whether the effects were clinically important (Roddy *et al.*, 2005). Table 2.9 summarizes the effect size for quadriceps strengthening exercises on pain and disability in knee OA.

- Range of motion/ Flexibility exercises

One guideline (AAOS, 2008) reported a recommendation for range of motion (ROM) / flexibility exercises in the management of knee OA. The recommendation was based on expert opinion. The guideline developers were unable to find any published studies to determine the effect of ROM/flexibility exercises on relieving pain or improving function in knee OA. In table 2.9 the recommendation for the use of ROM/flexibility exercises in the management of knee OA. ROM/ flexibility exercises were documented in the eligible guidelines as part of an exercise program for knee OA which included aerobic, quadriceps strengthening exercises and stretching. Consequently, the reviewers were unable to formulate recommendations for or against the use of ROM/flexibility exercises in the physiotherapeutic management of knee OA.

2.5.6.3 Aquatic-based exercises

Limited evidence supports the use of aquatic exercise as an intervention to manage patients with knee OA. Three guidelines (RACGP, 2009; ORASI, 2008; NICE, 2008) reported the effects of aquatic exercises on pain and functional disability in knee OA patients. Only one guideline (RACGP, 2008) reported direct recommendations related to the use of aquatic exercises in the management of knee OA. Table 2.9 summarises the recommendations for aquatic exercises. The recommendation was based on 3 RCTs (Cochrane *et al.*, 2005; Hinman *et al.*, 2007; Fransen *et al.*, 2007) which examined the

effect of aquatic exercises on pain and functional disability in knee OA patients. One guideline (NICE, 2008) reported limited evidence for the benefit of aquatic exercises in knee OA management and a recommendation was not formulated.

Table 2.9 Recommendations for the use of land- and aquatic-based exercises

	Guideline	Recommendations	ES (95% CI)
Aerobic exercises	AAOS (2008)	Patients with symptomatic OA of the knee should be encouraged to participate in low-impact aerobic fitness exercises	pain d= 0.52 (0.34,0.70) disability d=0.46 (0.25,0.67)
	RACGP (2009)	There is good evidence to support GPs recommending land-based exercise for people with OA of the knee	pain d= 0.52 (0.34,0.70) disability d=0.46 (0.25,0.67)
	OARSI (2008)	Patients with knee OA should be encouraged to undertake, and continue to undertake, regular aerobic, muscle strengthening and range of motion exercises	pain d= 0.52 (0.34,0.70) disability d=0.46 (0.25,0.67)
	NICE (2008)	Exercise should be a core treatment for people with OA, irrespective of age, co morbidity, pain severity or disability. Exercise should include: <ul style="list-style-type: none"> • Local muscle strengthening • General aerobic fitness 	
Strengthening exercises	AAOS (2008)	Quadriceps strengthening for patients with symptomatic OA of the knee is recommended.	Pain d= 0.32 (0.23, 0.42) Disability = 0.32 (0.23, 0.41)
	RACGP (2009)	There is good evidence to support GPs recommending land based exercise for people with OA of the knee	Pain = 0.42
	OARSI (2008)	Patients with knee OA should be encouraged to undertake, and continue to undertake, regular aerobic, muscle strengthening and range of motion exercises	Pain d= 0.32 (0.23, 0.41) Disability d= 0.32 (0.23, 0.41)
	NICE (2008)	Exercise should be a core treatment for people with OA, irrespective of age, co-morbidity, pain severity or disability. Exercise should include: <ul style="list-style-type: none"> • Local muscle strengthening • General aerobic fitness. 	
Flexibility exercises	AAOS(2008)	Range of motion/flexibility exercises are an option for patients with symptomatic OA of the knee.	
Aquatic exercises	RACGP (2009)	There is some evidence to support GPs recommending aquatic therapy for treatment of knee OA.	Pain d= 0.44 (0.03, 0.85) Disability d= 0.76 (0.33, 1.17)

Table 2.10 provides the results of the body of evidence matrix for land- and aquatic-based exercises in the management of knee OA.

Table 2.10 Body-of-evidence matrix for land- and aquatic-based exercises

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Land	A	A	B	A	A
Aquatic	B	C	B	A	A

The composite recommendation for land- and aquatic-based exercises in the EB physiotherapeutic management of knee OA is as follows:

Composite recommendation 2

Regular low impact aerobic (land-based) exercises are effective for improving fitness, muscle strengthening and improving ROM in patients with knee OA.

Strategy 1: Exercise can be conducted effectively on land in the management of knee OA.

Strategy 2: Exercise can be conducted effectively in water in the management of knee OA.

2.5.6.4 Weight-loss programs

Recommendations related to the use of weight-loss programs in the management of knee OA were documented in all the eligible guidelines (Table 2.11). There is good evidence that weight-loss programs should be a core component in the management of obese and overweight knee OA patients (NICE, 2008).

Table 2.11 Recommendations for the use of weight-loss programs in the management of knee OA

Guideline	Recommendations	ES
AAOS (2008)	Patients with symptomatic OA of the knee, who are overweight (as defined by a BMI>25), should be encouraged to lose weight (a minimum of five percent (5%) of body weight) and maintain their weight at a lower level with an appropriate program of dietary modification and exercise.	Pain $d = 0.20$ (0.00, 0.39) Stiffness $d = 0.36$ (-0.08, 0.80) Functional improvement $d = 0.69$ (0.24, 1.14)
RACGP (2009)	There is good evidence to support GPs recommending weight reduction for obese patients with OA of the knee.	Pain $d = 0.20$ Disability $d = 0.23$
OARSI (2008)	Patients with hip and knee OA, who are overweight, should be encouraged to lose weight and maintain their weight at a lower level.	Pain $d = 0.20$ (0, 0.39) Disability $d = 0.23$ (0.04, 0.42)
NICE (2008)	Interventions to achieve weight loss should be a core treatment for obese or overweight knee OA patients.	

The recommendation for weight-loss programs in the management of knee OA was based on two RCTs and one SR (Christensen *et al.*, 2005; Christensen *et al.*, 2007; Roddy *et al.*, 2005). The evidence of this recommendation was evaluated as Level I since the included RCTs were of high-quality and well-designed. Table 2.12 provides the results of the body of evidence matrix for weight-loss programs in the management of knee OA.

Table 2.12 Body-of-evidence matrix for weight-loss programs

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Weight loss	A	A	B	A	A

The composite recommendation for the use of weight-loss programs in the EB physiotherapeutic management of knee OA is as follows:

Composite recommendation 3

Overweight or obese knee OA patients should be encouraged to lose weight.

Strategy 1: *Weight should be maintained at the lower level with an appropriate program of dietary modification and exercise.*

Strategy 2: *A 5% minimum weight-loss should be the aim for knee OA patients.*

2.5.6.5 Multimodal physiotherapy

Evidence was collected from three moderate-quality RCTs (Deyle *et al.*, 2000 and 2005; Hay *et al.*, 2005) and one low-quality RCT (Deyle *et al.*, 2000) for multimodal physiotherapy management of knee OA. The following recommendation was formulated by one of the eligible guidelines: “*There is some evidence to support General Practitioners (GPs) recommending multimodal physical therapy (up to 3 months) in the management of knee and hip OA*” (RACGP pg.25, 2009).

Table 2.13 provides the results of the body of evidence matrix for multimodal physiotherapy management of knee OA.

Table 2.13 Body-of-evidence matrix for multimodal physiotherapy

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Multimodal PT	C	C	C	A	A

The composite recommendation for multimodal physiotherapy in the EB physiotherapeutic management of knee OA is as follows:

Composite recommendation 4

The use of combination treatments (multimodal physiotherapy) in the management of knee OA patients are supported by modest evidence.

2.5.6.6 Thermotherapy

Three guidelines directly addressed the effect of thermotherapy in the management of knee OA (RACGP, 2009; OARSI, 2008; NICE, 2008). No result was found in the AAOS guideline. Table 2.14 summarizes the available recommendations for the use of thermotherapy in the management of knee OA.

Table 2.14 Recommendations for the use of thermotherapy in the management of knee OA.

Guideline	Recommendations
RACGP (2009)	There is some evidence to support GPs recommending cold therapy to treat symptoms of OA.
OARSI (2008)	Some thermal modalities may be effective for relieving symptoms in hip and knee OA.
NICE (2008)	The use of local heat or cold should be considered as an adjunct to core treatment.

Evidence for thermotherapy was collected from one SR (Brosseau *et al.*, 2003); two RCTs (Yurtkuran *et al.*, 1999; Clarke *et al.*, 1974) and one comparative study (Martin *et al.*, 1998). Table 2.15 provides the body of evidence matrix for thermotherapy in the management of knee OA.

Table 2.15 Body-of-evidence matrix for thermotherapy

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Thermotherapy	A	B	C	A	A

The composite recommendation for the use of thermotherapy in the EB physiotherapeutic management of knee OA is as follows:

Composite recommendation 5:

Modest evidence exists to support the use of hot and cold therapy for symptom relief in patients with knee OA.

Strategy 1: *Applying ice massage for 20 min × 5 times/week for two weeks showed clinically significant improvement in quadriceps strength in knee OA patients.*

Strategy 2: Applying ice three times per week for three weeks showed some improvement on pain in knee OA patients.

2.5.6.7 Electrotherapy

- Transcutaneous Electrical Nerve Stimulation (TENS)

The use of TENS in the management of knee OA was recommended by three of the eligible guidelines. Table 2.16 summarises these recommendations. Evidence for efficacy documented by OARSI was collected from one Cochrane SR (Osiri *et al.*, 2000), a SR (Brosseau *et al.*, 2004) and one MA (Bjordal *et al.*, 2007). Consequently, the short-term effect (2 to 4 weeks) of TENS on pain in knee OA patients was found to be clinically significant based on the evidence included in the guideline. Additionally, two low-quality RCTs (Paker *et al.*, 2006; Adedoyin *et al.*, 2005) were included. One RCT (Paker *et al.*, 2006) compared intra-articular injection of hylan (three injections once weekly for three weeks) to TENS (applied five times per week for 20min at 150 Hz for three weeks). The study reported no benefits for the intra-articular injection of hylan in reducing pain and stiffness and improving function and Lequesne index at 6-month follow-up compared to TENS, in knee OA patients. The second RCT provided evidence that TENS or interferential current (two times weekly for 20 min) in association with 20min exercises showed no benefit compared to 20min exercises alone. All the groups showed improvement in WOMAC over time. Finally, NICE (2008) reported one SR (Osiri *et al.*, 2000) and three RCTs (Cheing *et al.*, 2002; Cheing and Hui-Chan, 2004; Paker *et al.*, 2006) which examined the effects of TENS in knee OA.

- LASER

One guideline reported a recommendation for the use of LASER in the management of knee OA patients (RACGP, 2009). Table 2.16 summarises this recommendation. Weak evidence from a low-quality RCT (Tascioglu *et al.*, 2004) was reported for the use of LASER in the management of knee OA. No effects were reported on WOMAC pain, stiffness or disability scores, compared to placebo LASER treatment at three-week and six-month follow-up. One MA (Brosseau *et al.*, 2006) and two RCTs (Tascioglu *et al.*,

2004; Yurtkuran *et al.*, 2007) were included in NICE. No benefit was reported for the use of LASER in the management of knee OA patients.

- Ultrasound (US)

A summary of the recommendations relating to the use of ultrasound (US) in the management of knee OA is detailed in Table 2.16. One moderate-quality RCT (Robinson *et al.*, 2005) reported no benefit of US compared to placebo. Assessment was performed immediately after the treatment and at three-month follow-up. Zhang *et al.* (2010) reported in the updated OARSI guideline that US had no effect on pain in knee OA patients (ES 0.06; 95% CI: -0.39 - 0.52).

- Pulsed Short-Wave Diathermy (SWD)

One guideline (RACGP, 2009) suggested that there is no benefit for the use of pulsed SWD in the management of patients with knee OA (Table 2.16). These results were confirmed by Zhang *et al.* (2010) in the updated OARSI (2008). Evidence for electrotherapy was collected from seven SRs (Osiri *et al.*, 2000; Brosseau *et al.*, 2006; Bjordal *et al.*, 2007; McCarthy *et al.*, 2006; Hulme *et al.*, 2002; Robinson *et al.*, 2006) and six RCTs (Adedoyin *et al.*, 2005; Paker *et al.*, 2006; Cheing *et al.*, 2002; Cheing and Hui-Chan, 2004; Tascioglu *et al.*, 2004; Yurtkuran *et al.*, 2007). Cumulative data showed a small effect for function (ES=0.33: 95% CI 0.07-0.59) and no significant efficacy for pain reduction (ES=0.16: 95% CI -0.08-0.39).

Table 2.16 Electrotherapy recommendations

Electrotherapy	Guideline	Recommendation
TENS	RACGP(2009)	There is some evidence to support GPs recommending the use of TENS for at least 4 weeks for treatment of OA of the knee.
	OARSI (2008)	Transcutaneous electrical nerve stimulation (TENS) can help with short-term pain control in some patients with knee OA.
	NICE (2008)	Healthcare professionals should consider the use of TENS as an adjunct treatment for pain in knee OA patients.
LASER	RACGP(2009)	There is weak evidence to support GPs recommending low level laser therapy for the short-term treatment of knee OA.
US	RACGP(2009)	There is some evidence to suggest that therapeutic US is of no benefit in treating OA of the knee. GPs could inform patients about lack of evidence regarding the benefit of US over placebo.
SWD	RACGP(2009)	There is good evidence to suggest that electromagnetic field or electric stimulation interventions are of no benefit in the treatment of knee OA. GPs could inform patients about lack of evidence lack of evidence regarding the benefit of US over placebo.

Table 2.17 illustrates the results of the body of evidence matrix for electrotherapy.

Table 2.17 Body-of-evidence matrix for electrotherapy

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
TENS	C	C	C	A	A
US	C	C	C	A	A
LASER	C	C	C	B	A
SWD	C	C	D	B	A

The composite recommendation for the use of electrotherapy in the EB physiotherapeutic management of knee OA is as follows:

Composite recommendation 6

There is modest evidence to support the use of electrotherapy modalities as adjunctive pain treatment to exercise in the management of knee OA.

Strategy 1: *TENS has modest evidence if used regularly for at least four weeks in the management of knee OA.*

Strategy 2: *There is weak evidence to support the use of low level LASER therapy as adjunctive therapy in the management of knee OA.*

Strategy 3: *Little evidence to support the use of US in the management of knee OA.*

Strategy 4: Little evidence to support the use of electromagnetic field therapy in the management of knee OA.

2.5.6.8 Manual therapy

The effects of manual therapy in patients with knee OA were discussed in one guideline (NICE, 2008). The guideline development group stated the following recommendation: “*Manipulation and stretching should be considered as an adjunct to core treatment in the management of hip and knee OA.*” (NICE, 2008; Page 96). This recommendation was based on five RCTs (Bennell *et al.*, 2005; Deyle *et al.*, 2000 and 2005; Tucker *et al.*, 2003; Moss *et al.*, 2007). Table 2.18 provides the results of the body of evidence matrix for manual therapy.

Table 2.18 Body-of-evidence matrix for manual therapy

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Manual therapy	A	C	D	B	B

The composite recommendation for the use of massage in the EB physiotherapeutic management of knee OA is as follows:

Composite recommendation 7

Manual therapy has modest evidence to manage symptoms of knee OA.

2.5.6.9 Massage

One recommendation related to the use of massage in the management of knee OA was found in the included CGs (RACGP, 2009) (Table 2.19).

Table 2.19 Massage recommendation

Guideline	Recommendation
RACGP (2009)	There is weak evidence to support GPs recommending massage therapy for treatment of OA of the knee.

Evidence was collected from one low-quality RCT (Perlman *et al.*, 2006), which is considered a poor study due to poor allocation methods, lack of blinding, small sample size and high number of drop outs (56% in the treatment group; 47% in the control group). Results for the body-of-evidence matrix for massage are provided in table 2.20.

Table 2.20 Body-of-evidence matrix for massage

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Massage	D	NA	D	A	A

The composite recommendation for massage in the EB physiotherapeutic management of knee OA is as follow:

Composite recommendation 8

There is weak evidence to support the use of massage in the management of knee OA.

2.5.6.10 Braces and assistive devices

Recommendations related to the use of braces and assistive devices in the management of knee OA were documented in all the eligible guidelines (Table 2.21). Evidence was collected from two SRs (Brouwer *et al.* 2008; Reilly *et al.*, 2006) and four RCTs (Keating *et al.*, 1993; Kirkley *et al.*, 1999; Toda *et al.*, 2001; Maillefert *et al.*, 2001).

Table 2.21 Brace and assistive device recommendations

Guideline	Recommendations
AAOS (2008)	<ol style="list-style-type: none"> 1. Lateral heel wedges should not be prescribed for patients with symptomatic medial compartmental OA of the knee. 2. Unable to recommend for or against the use of a brace with a valgus directing force for patients with medial uni-compartmental OA of the knee. 3. Unable to recommend for or against the use of a brace with a varus directing force for patients with lateral uni-compartmental OA of the knee.
OARSI (2008)	<ol style="list-style-type: none"> 1. Walking aids can reduce pain in patients with knee OA. Patients should be given instruction for the optimal use of a cane or crutch in the contralateral hand. Frames or wheeled walkers are often preferable for those with bilateral disease. 2. In patients with knee OA and mild/moderate varus or valgus instability, a knee brace can reduce pain, improve stability and diminish the risk of falling. 3. Every patient with knee OA should receive advice concerning appropriate footwear, and that insoles can reduce pain and improve ambulation. Lateral wedged insoles can be of symptomatic benefit for some patients with medial tibio-femoral compartment OA.
NICE (2008)	<ol style="list-style-type: none"> 1. Healthcare professionals should offer advice on appropriate footwear (including shock absorbing properties) as part of core treatment for people with knee OA. 2. Bracing/joint supports/insoles as an adjunct to core treatment of knee OA patients who have biomechanical joint pain or instability, should be considered. 3. Assistive devices (for example walking sticks and tap turners) should be considered as adjuncts to core treatment for knee OA patients who have specific problems with activities of daily living. Healthcare professionals may need to seek expert advice in this context (for example from occupational therapists or disability equipment assessment centers).

Table 2.22 illustrates the body of evidence matrix for braces and assistive devices.

Table 2.22 Body-of-evidence matrix for bracing.

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Crutches/ frames	A	A	D	A	A
Knee brace	D	D	D	A	A
Foot wear	D	D	D	A	A
Insoles	D	D	D	A	A

The composite recommendation for the use of braces and assistive devices in the EB physiotherapeutic management of knee OA is as follow:

Composite recommendation 9

There is moderate evidence for the use of assistive devices for unloading the joint in the management of knee OA.

Strategy 1: *Walking aids such as canes and crutches or frames (with or without wheels) have moderate evidence for effectiveness on reducing functional disability in knee OA patients.*

Strategy 2: *Weak evidence to support the use of knee braces in knee OA.*

Strategy 3: *Advice concerning appropriate foot wear should be recommended.*

Strategy 4: *Little evidence to support the use of insoles in the management of knee OA patients. Lateral-wedged insoles can be of symptomatic benefit for some patients with medial knee OA.*

2.5.6.11 Acupuncture

All the guidelines examined the effect of acupuncture in patients with knee OA (Table 2.23). Evidence for acupuncture was collected from one MA (Manheimer *et al.*, 2007) and ten RCTs (Ezzo *et al.*, 2001; White *et al.*, 2007; Kwon *et al.*, 2006; Moe *et al.*, 2007; Vas *et al.*, 2007; Yamashita *et al.*, 2006; Witt *et al.*, 2005; Foster *et al.*, 2007; Yurtkuran *et al.*, 2007 ; Vas *et al.*, 2006). Conflicting evidence was noticed by the AAOS. Therefore, they performed a *de novo* SR to the published SRs and confirmed that the conclusions were conflicting. Additionally, the AAOS further performed a MA which clarified that the effects of acupuncture on pain and functional disability were dependant on the study designs of the included studies (AAOS, 2008). Conversely, NICE (2008) stated a clear, yet negative recommendation for the use of electro-acupuncture in the management of knee OA patients. Evidence for clinical or cost-effectiveness was not sufficient to formulate firm recommendations for the use of acupuncture in the management of knee OA (NICE, 2008).

Table 2.23 Acupuncture recommendations

Guideline	Recommendations	ES
AAOS (2008)	We are unable to recommend for or against the use of acupuncture as an adjunctive therapy for pain in knee OA patients.	Pain $d = 0.35$, (95% CI 0.15- 0.55)
RCAGP (2009)	There is some evidence to support GPs recommending acupuncture for treatment of knee OA.	
OARSI (2008)	Acupuncture may be of symptomatic benefit in patients with knee OA.	Pain $d = 0.35$, (95% CI 0.15- 0.55)
NICE (2008)	Electro-acupuncture should not be used to treat people with knee OA.	

Results of the body of evidence matrix are provided in table 2.24.

Table 2.24 Body-of-evidence matrix for acupuncture

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Acupuncture	A	C	C	C	C

The composite recommendation for the use of acupuncture in the EB physiotherapeutic management of knee OA is as follows:

Composite recommendation 10

There is modest evidence for the use of acupuncture in the management of knee OA pain.

2.5.6.12 Patellar taping

Two of the included guidelines reported recommendations for the use of patellar taping as part of the management program for knee OA (Table 2.25). The strength of the recommendations was based on one SR, documented in the AAOS, which concluded that the effect of medially-directed taping is statistically significant and possibly clinically important immediately and four days after taping when compared to sham taping. The

effect lasted for three weeks when compared to no taping group (Warden *et al.*, 2008). Evidence for patellar taping was collected from one SR (Warden *et al.*, 2008) and four RCTs (Hinman *et al.*, 2003; Cushnaghan *et al.*, 1994; Hinman *et al.*, 2003 B; Quiltyet *et al.*, 2003).

Table 2.25 Patellar taping recommendations

Guideline	Recommendations
AAOS (2008)	We suggest patients with symptomatic OA of the knee use patellar taping for short-term relief of pain and improvement in function
RCAGP (2009)	There is weak evidence to support GPs recommending patellar taping for treatment of knee OA.

The body of evidence matrix for patellar taping is provided in table 2.28.

Table 2.26 Body-of-evidence matrix for patellar taping

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Patellar taping	A	C	C	B	B

The composite recommendation for patellar taping in the EB physiotherapeutic management of knee OA is as follows:

Composite recommendation 11

There is modest evidence to support the use of patellar taping in knee OA management.

Strategy 1: Medial-directed taping shows clinically important improvement in the short- and long-term when compared to sham or no taping.

2.6 Conclusion

This chapter describes comprehensive, evidence-based recommendations for the physiotherapeutic management of knee OA, distilled from four good quality international guidelines. The most convincing evidence was reported for SMEPs, physical exercise and weight-loss programs. Conversely, there was unconvincing evidence for most of the physiotherapy modalities namely, electrotherapy; thermotherapy; patellar taping and

acupuncture. The composite recommendations concluded from the existing CGs, provide physiotherapists with sound EB guidance to plan management programs and effectively treat patients with knee OA.

The following chapter deals with the methodology of main study.

CHAPTER 3

Methodology

This chapter details the methodology used in the main study of this project.

3.1 Aim

The main aim of this study was to promote the translation of evidence-based (EB) physiotherapeutic interventions into the management of patients with knee OA.

3.2 Research question

The following research question was addressed in this study:

“What is the effect of a specially-designed evidence-based practice (EBP) workshop aimed at educating physiotherapists about EB physiotherapeutic techniques for the management of knee OA patients?”

3.3 Objectives

The main objectives of this study were to:

- Determine the current physiotherapeutic interventions utilized in the management of patients with knee OA who attended physiotherapy in the past three months;
- Educate physiotherapists about implementing EB physiotherapeutic interventions in the management of patients with knee OA;
- Determine whether the specifically-designed EBP educational workshop influenced the physiotherapists’ selection of techniques to manage knee OA patients.

3.4 Study design

A pre-post quasi-experimental study design was applied to address the study objectives. Figure 3.1 provides a graphical representation of the study procedures.

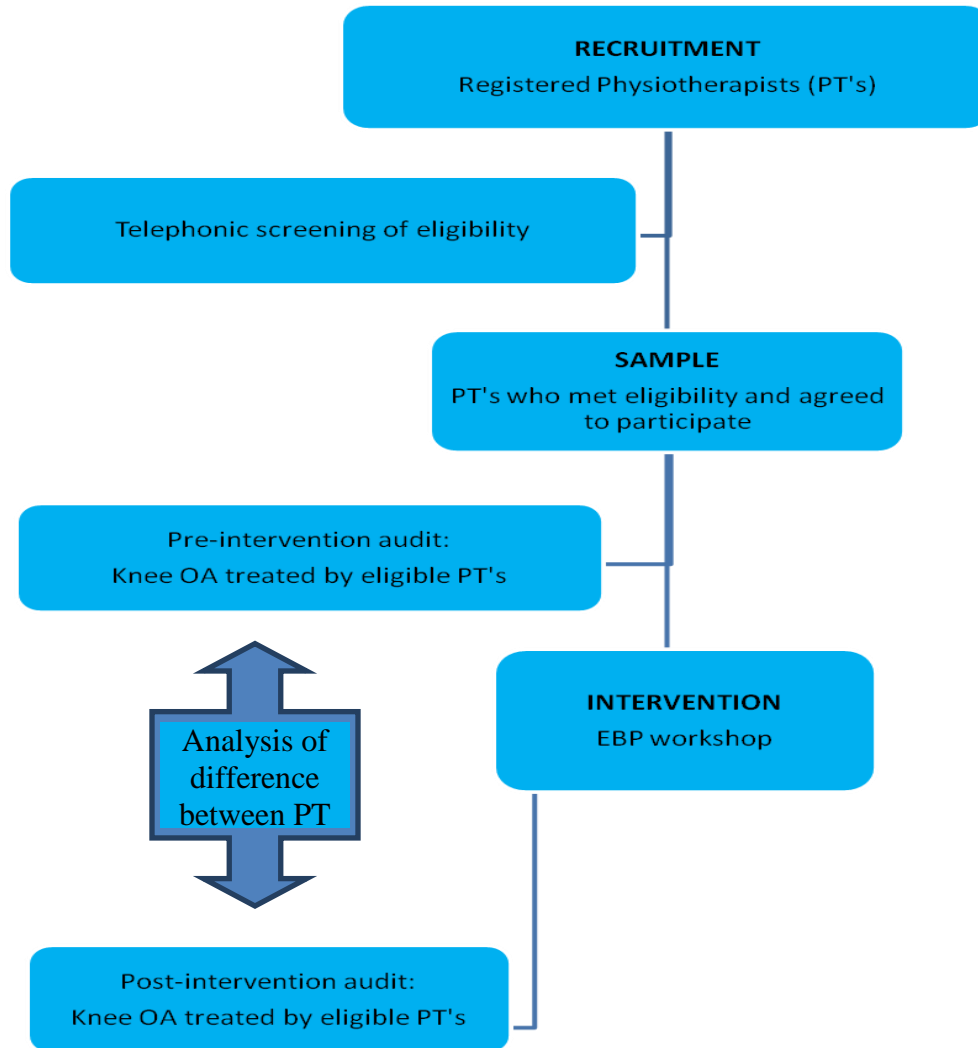


Figure 3.1 Flow chart of study methodology

3.5 Study setting

Data collection was conducted at public physiotherapy centres/clinics in Jerusalem (UAE) from July 2011 to October 2011 by the principle researcher. All residents of

Jerusalem are covered by government/public medical insurance. The medical insurance covers physiotherapy (in- and out-patient) services for all public patients.

3.6 Sampling

3.6.1 Study population

The study population comprised of physiotherapists registered with the Palestinian Physiotherapy Association (PPA) – Jerusalem and who were employed in public physiotherapy clinics and rehabilitation centres in Jerusalem.

3.6.2 Sample recruitment source

Participants were recruited from a list of physiotherapists obtained from the Palestinian Physiotherapy Association (PPA) - Jerusalem. A total of 44 physiotherapists were registered with the PPA (Jerusalem) at the time of this study.

3.6.3 Sample characteristics

3.6.3.1 Inclusion criteria

Participants were included if they:

- Had a BSc (Physiotherapy) degree with/without a higher degree in physiotherapy;
- Were registered as a physiotherapist with the PPA (Jerusalem);
- Had treated at least five patients with knee OA within a retrospective period of three months prior to the commencement of the study
- Were able to provide contacts details of the knee OA patients managed at their clinics three months before and after the EBP workshop presentation.

3.7 Data collection

The data collection tools were designed to collect demographic information from the physiotherapists and details of the physiotherapeutic management of the knee OA patients. The development process and purpose of the data collection tools is described in the subsequent sections.

3.7.1 Knee OA patients' data capture form

A patient data capture form (Appendix 4) was compiled by the research team to audit the records of the patients. The data capture form consisted of three sections. The first section was designed to collect demographic data such as: *age, gender, marital status, weight, occupation, time of first episode, number of physiotherapy episodes in the last five years for knee OA and number of treatment sessions during the last episode*. The second section of the data capture form was designed to collect data related to diagnosis and treatment of knee OA patients, such as: *other forms of intervention (pharmacological or/and surgical), diagnostic methods and criteria and whether the right, left or both knees were affected by OA*. The third section was designed to collect data related to physiotherapy management such as: *physiotherapy treatment aims, main findings of physical examination, outcome measures and scores, and physiotherapy modalities applied from the first up to a maximum of ten sessions*.

3.7.2 Physiotherapists' data capture form

A data capture form (appendix 5) was compiled and the following information of the participating physiotherapists was collected: *age, gender, qualification, years of experience, number of OA patients treated weekly, number of years the physiotherapist treated knee OA patients and the type of practice in which the physiotherapist was currently employed*.

3.8 Data collection procedures

The following sections outline the data collection procedures.

3.8.1 Recruitment and consent

A list of names of physiotherapists currently registered with the PPA (Jerusalem) was obtained from the PPA headquarters. All physiotherapists registered on this list were contacted telephonically by the principal researcher to screen for eligibility. Eligible physiotherapists were telephonically invited to participate in the study by the principle research (Figure 3.1) and informed signed consent was obtained from each physiotherapist.

Physiotherapists who consented to participate provided the contact details of patients who were treated for knee OA at their clinics in the three months preceding the commencement of this study. After the EBP workshop presentation, the participating physiotherapists continued treating knee OA patients for three months. At the end of the three-month period, participating physiotherapists were contacted again and asked to provide the contact details of patients who were treated for knee OA at their clinics during the three-month time period following the EBP workshop presentation. The knee OA patients, for whom details were provided either before or after the EBP workshop was presented, were telephonically invited to participate in the study by the principal researcher. The study aims, objectives and information about the process of conducting a record audit were described to the patients. Arabic written informed consent (Appendix 6) was obtained from all knee OA patients who agreed to participate by the participating physiotherapists who were trained to obtain consent by the principle researcher. The principal researcher telephonically contacted all patients who were already discharged and consent was obtained by the principal researcher at their house or the clinic they attended.

3.8.2 Intervention

The study intervention comprised of a specially-designed knee OA EBP educational workshop (Appendices 7A and 7B). The information presented during the EBP workshop was based on the results of a systematic review of knee OA guidelines conducted prior to the commencement of this study (Chapter 2). During the workshop, the principal researcher provided the participating physiotherapists with the basic information related to EBP, as well as information to enlighten the gap between the current practice and EBP for knee OA in Jerusalem. Revision of EBP recommendations to ensure relevance to the local setting was also addressed. The workshop was conducted at one of the physiotherapy clinics in Jerusalem. The principal researcher presented the workshop. A MS PowerPoint presentation was provided to the physiotherapists.

The following topics were discussed:

- A full description of the systematic review (Chapter 2)
- Definitions of the research terms
- Definitions of evidence hierarchies and evidence-based clinical guidelines (EBCGs)
- EB physiotherapeutic recommendations for knee OA patients
- Recommendations for EB physiotherapeutic interventions in the management of knee OA
- Case studies

In addition, one hour of open discussion about barriers and facilitation for the use of EB knee OA interventions in clinical practice took place. A printed copy of the recommendations for the use of EB physiotherapeutic interventions in the management of knee OA and the terms used in the research was provided to the participating physiotherapists. Electronic copies of the clinical guidelines were sent to the all participating physiotherapist as well. To prevent information bias, the outcomes assessed during the second audit was masked by the researcher i.e. the researcher did not specifically disclose that the selection of physiotherapeutic techniques were the primary outcome after the intervention.

3.8.3 Pre-intervention audit

The principal researcher conducted a retrospective audit of the clinical records for all the knee OA patients' who visited the five participating physiotherapy clinics three months prior to the commencement of this study (figure 3.1). Four of the five participating clinics used electronic recording systems. The clinic managers gave the principle researcher permission to access the clinics' electronic databases to retrieve patient management related information, and provided the principle researcher with their personal access passwords. Access to the system was limited to the knee OA patients who agreed to participate. One clinic used paper records. At this clinic a record audit was conducted in the manager's office. The demographic data capture form was completed at the beginning of the EBP educational workshop by the physiotherapists.

3.8.4 *Post-intervention audit*

The principal researcher repeated the retrospective audit of knee OA patients' records three months after the EBP educational workshop using the knee OA data capturing form (Figure 3.1). The same procedure mentioned in the pre-intervention audit (3.8.3) was performed.

3.9 Data extraction and validation

All the information provided on the knee OA data capture forms and physiotherapists' data forms were extracted and entered into a purpose-built MS Excel worksheet. Random checks of data were performed by the study supervisor to ensure accuracy of data extraction and entry. Five forms from the Pre-test and five forms from the Post-test were randomly checked by the study supervisor.

3.10 Statistical analyses

Statistica software (Version 10) was used to analyze data. Analysis was conducted by a statistics consultant from the Center of Statistical Analysis, Stellenbosch University, (South Africa). Descriptive statistics were used to describe the study sample in terms of demographics. The Mann-Whitney U test was used to compare the physiotherapists' choices of treatments before and after the EBP workshop.

3.11 Ethical considerations

The following ethical aspects were taken into consideration and addressed throughout the study:

1. The research project protocol was approved and registered with the Health Research Ethics Committee, Faculty of Health Sciences, Stellenbosch University (South Africa) (Appendix 8).
2. The research project protocol was approved and registered by the research committee of the PPA-Jerusalem (Appendix 9).
3. Signed informed consent was obtained from the recruited physiotherapists.

4. Informed Arabic written consent was obtained from all recruited knee OA patients (Appendix 6).
5. All patients had the right to refuse the principle researcher access to their clinical records saved on the clinic electronic databases (Appendix 11).
6. Patients were assured that all personal information obtained from the records would remain confidential throughout the study and afterwards.
7. Patients were assured that participation in the study was voluntary and withdrawal at any stage was allowed.

3.12 Language barriers

To ensure that the patients understood the aims and objectives of this study and to prevent any language barriers, the consent form was translated from English into Arabic (Appendices 12 and 13). No language barriers were anticipated for the participating physiotherapists since the study language for physiotherapy in the local universities is English, hence consent forms for participating physiotherapists were only provided in the English language, and not translated to Arabic.

CHAPTER 4

Results

The primary aim of the current study was to promote the translation of evidence-based (EB) physiotherapeutic interventions into the management of patients with knee OA.

The following chapter presents the results of the current study.

4.1 Study sample

4.1.1 Sample recruitment and size

Ten physiotherapists who met the inclusion criteria of this study agreed to participate. All physiotherapists in Jerusalem were screened for inclusion. Physiotherapists working in the public sector were the only physiotherapists who met the inclusion criteria. Figure 4.1 illustrates the recruitment procedure for physiotherapists in the study.

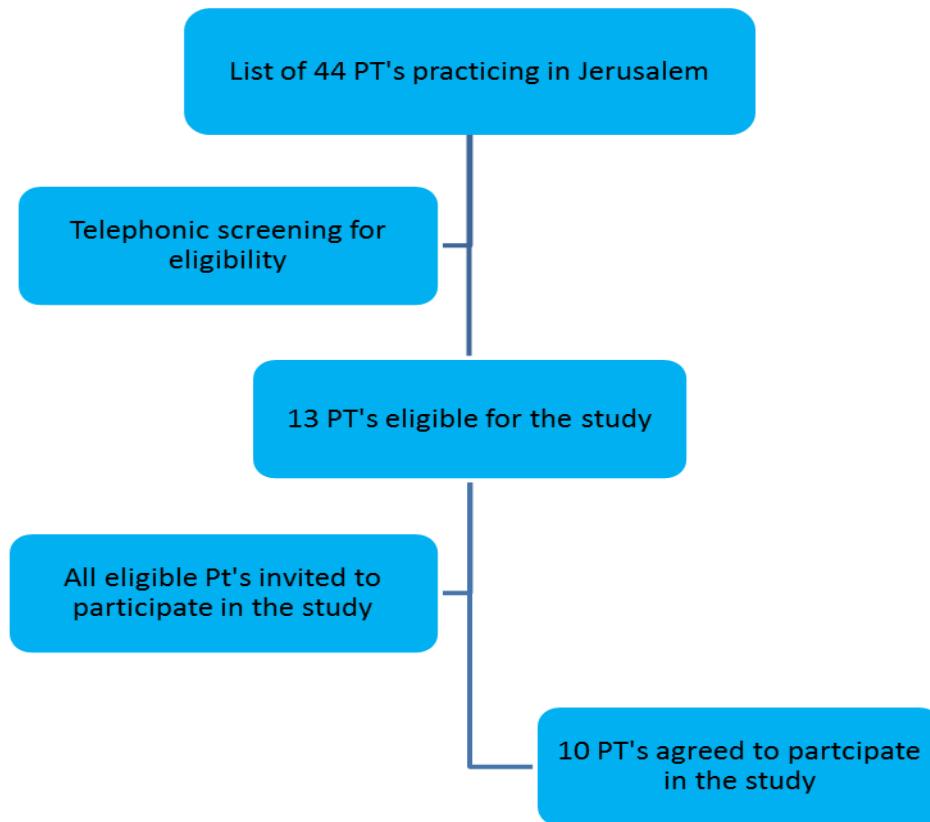


Figure 4. 1 Flow chart for physiotherapists' recruitment

4.1.2 Description of physiotherapists

Six of the participating physiotherapists were males. The mean age was 32.7 years. Seven of the subjects had a BSc in Physiotherapy. Three participants had a Master's Degree in Physiotherapy. Six subjects were currently employed in public practice. The remaining participants (n=4) were employed in both public and private practices. Seven participants worked on a full-time (more than 35h per week) and part-time basis (less than 35h per week).

4.1.3 Description of knee OA patients

Fifty-one patients were recruited for the pre-intervention. Twenty-nine subjects were recruited for the post-intervention phases. The mean age of the patients was 60.01 (SD

± 9.82) years. Thirty males (37.5%) and fifty females (62.5%) participated in the study. Characteristics of knee OA patients are illustrated in table 4.1.

Table 4.1 Characteristics of knee OA patients' (pre- and post-intervention audit groups)

	Valid N	Mean	CI -95%	CI 95%	SD
Age	80	60.01	57.83	62.20	9.82
Weight (kg)	57	91.14	86.85	95.42	16.14
Total of episodes in 5 yrs	79	1.44	1.21	1.66	0.99
PT sessions	79	6.22	5.43	7.02	3.54
VAS score (assessment)	80	8.05	7.71	8.38	1.49

4.2 Audit results

4.2.1 Pre-intervention audit group

A retrospective record audit of clinical records of 19 male (37.25%) and 32 female (62.75%) knee OA patients was conducted during the pre-intervention stage. The mean age of these patients was 59.3(SD ± 9.82) years. Table 4.2 illustrates the characteristics of knee OA patients in the pre-intervention audit group.

Table 4.2 Knee OA patient characteristics: Pre intervention audit group

	Valid N	Mean	CI -95%	CI 95%	SD
Age	51	59.30	56.36	62.24	9.82
Weight	36	90.75	84.77	96.72	16.14
Total of episodes in 5 yrs	50	1.54	1.27	1.80	0.99
PT sessions	50	6.90	6.02	7.77	3.54
Vas score (assessment)	51	8.17	7.78	8.56	1.49

4.2.2 Post-intervention audit group

Twenty nine knee OA patients were recruited and agreed to a record audit for the Post EBP workshop stage. Eleven males (37.93%) and eighteen females (62.07%) participated in the study. The mean age of the patients was 61.27 (SD ± 8.66) years.

Table 4.3 Knee OA patient characteristics: Post-intervention audit

	Valid N	Mean	CI -95%	CI 95%	SD
Age	29	61.27	57.97	64.57	8.66
Weight	21	91.80	85.64	97.97	13.54
Total of episodes in 5 yrs	29	1.27	0.85	1.69	1.09
PT sessions	29	5.06	3.54	6.59	4.01
Vas score (assessment)	29	7.82	7.19	8.46	1.67

4.2.3 Diagnosis and pharmacological interventions

The following section will focus on the diagnosis that was documented in the patients' records, the affected side and the pharmacological intervention. The results in this section include both groups of patients; pre- and post- intervention audit.

4.2.3.1 Diagnosis

In terms of diagnosis, only four patients (5%) were diagnosed with knee OA based on X-ray results. Eleven patients (13.75%) were diagnosed based on the clinical examination, while 65 patients were diagnosed based on both clinical examinations and X-ray results.

4.2.3.2 Affected side

Twenty eight patients (35%) suffered from right knee OA, twenty four (30%) suffered from left knee OA and twenty eight patients (35%) suffered from bilateral knee OA.

4.2.3.3 Pharmacological intervention

Forty one subjects (51.25%) reported that they received pharmacological intervention as well as physiotherapy sessions.

4.3 Physiotherapy assessment

4.3.1 Physical examination and assessment tools

Data related to the physical examination and assessments tools used in clinical practice to assess knee OA patients was collected from the patients' records. Table 4.4 illustrates the results of the main findings.

Table 4.4 Assessment tools

Physical examination	Number of patients	Percentage % (n=80)
Vas	80	100
Muscle test (Oxford)	73	91.25
ROM	71	88.75
Functional test	61	76.25
Vas (reassessment)	53	66.25
ROM (reassessment)	35	43.75
Patient self report	11	13.75
WOMAC	0	0
WOMAC (reassessment)	0	0
Patient self report (reassessment)	0	0

4.3.2 Physiotherapy treatment aims

According to the physiotherapist's notes found in the patients' clinical records, the following treatment aims were reported for treating knee OA patients. The total number of treatment aims reported in the patients' files was 265 (n=80) (Table 4.5).

Table 4.5 Summary of PT aims documented in patients records

Aim	Number of patients (n=80)	Percentage (n=265)
Improve muscle strength	71	88.75
Reduce pain	69	91.25
Increase ROM	60	75
Improve quality of life	22	27.50
Reduce disability	21	26.25
Delay surgery	17	21.25
Improve balance	5	6.25

4.4 Physiotherapy interventions

In this section, the results of the effect of the EBP workshop on physiotherapists' choices of modalities for knee OA patients will be discussed. The result of each physiotherapeutic modality will be compared pre- and post- EBP workshop.

4.4.1 Self-management education program

No significant changes ($p = 0.143$) were noticed in the use of SMEP to treat knee OA patients between pre- and post- the EBP workshop (figure 4.1).



Figure 4.2 Self-management Pre vs. Post intervention

4.4.2 Exercise

No significant changes were noticed in the use of exercise as a preferable physiotherapeutic modality to treat knee OA patients. Exercise was documented in 98.47% of the physiotherapy sessions (figure 4.3). There was a decrease in the number of sessions which entailed exercise as a physiotherapeutic modality in the post-intervention group. However, the reduction of the use of exercise was not significant ($p=0.533$).

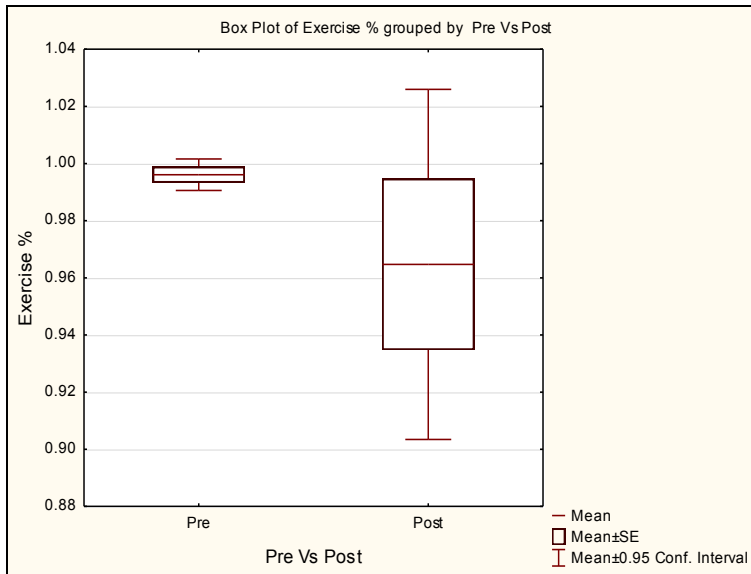


Figure 4.3 Exercise Pre vs. Post intervention

4.4.3 Weight-loss programs

A significant increase in the use of weight-loss programs as a modality to treat knee OA patients was noticed post-intervention ($p=0.008$) (figure 4.4).

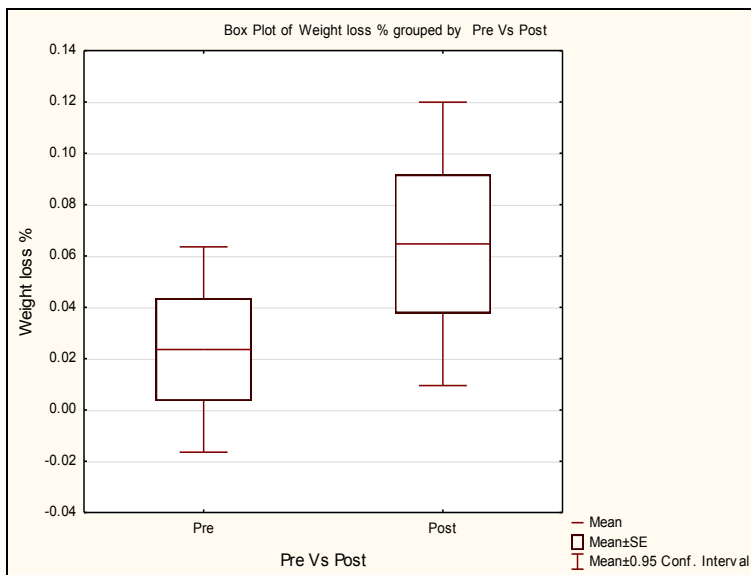


Figure 4.4 Weight-loss programs: Pre vs. Post intervention

4.4.4 Electrotherapy

No significant change was noticed in use of electrotherapy as a physiotherapeutic modality to treat knee OA patients post-intervention (figure 4.5). There was a decrease in the number of sessions in which electrotherapy was selected as a physiotherapy modality in the post-intervention group. However, the reduction in the use of electrotherapy was not significant ($p=0.680$).

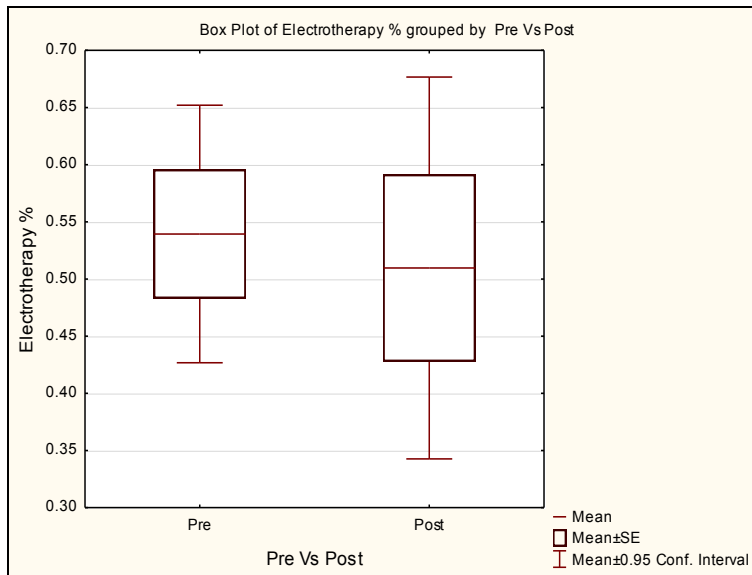


Figure 4.5 Electrotherapy Pre vs. Post intervention

4.4.5 Manual therapy

Despite the fact that there was an increase in the use of manual therapy modalities post-intervention (figure 4.6), the change was not statistically significant ($p=0.349$).

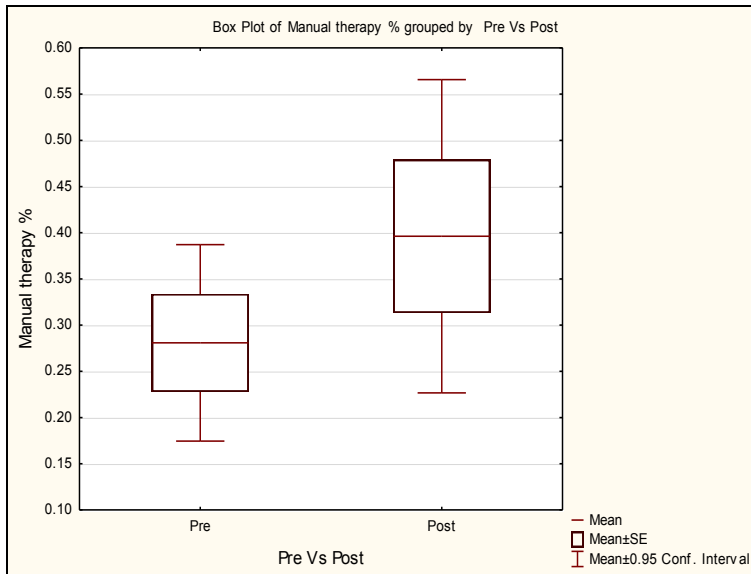


Figure 4.6 Manual therapy Pre vs. Post intervention

4.4.6 Massage

A decrease in the percentage of physiotherapists using massage to treat knee OA patients was noticed after the EBP workshop (figure 4.7). However, the changes were not significant ($p=0.68$).

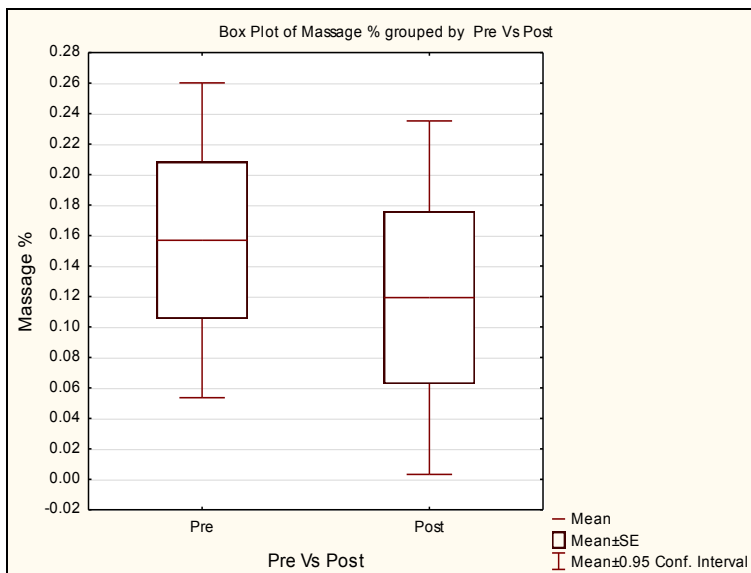


Figure 4.7 Massage Pre vs. Post intervention

4.4.7 Acupuncture

Acupuncture was not used as a modality during the pre- or post-intervention stages by any of the participating physiotherapists (figure 4.8).

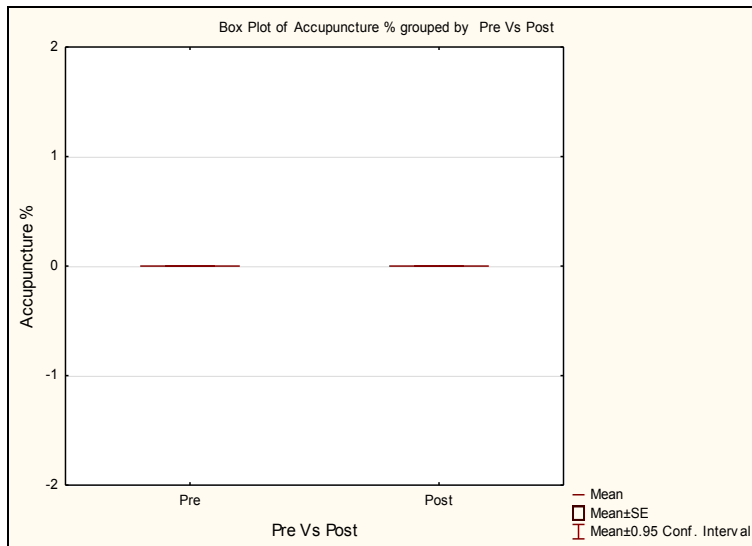


Figure 4.8 Acupuncture Pre vs. Post intervention

4.4.8 Thermotherapy

There was a decrease in the number of sessions which entailed thermotherapy as a physiotherapeutic modality in the post-intervention group. However, the reduction of the use of thermotherapy was not significant ($p=0.466$) (figure 4.9).

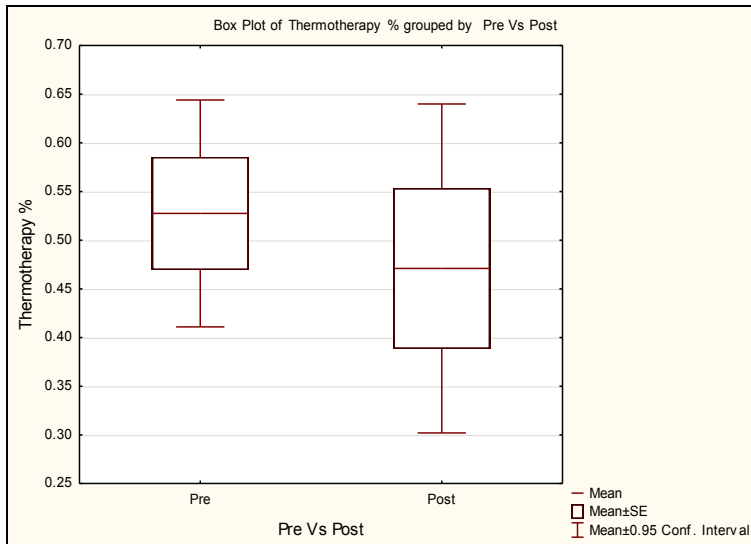


Figure 4.9 Thermotherapy Pre vs. post intervention

4.4.9 Taping

The use of therapeutic tape to treat knee OA patients was decreased after the EBP workshop (figure 4.10). The reduction was statistically significant compared to the pre-intervention group ($p=0.040$).

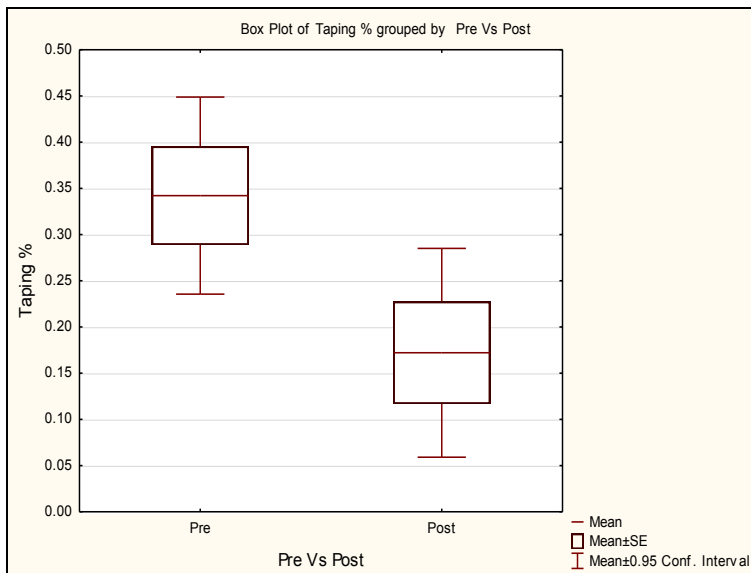


Figure 4.10 Taping Pre- vs. Post-intervention

4.4.10 Bracing

A small percentage of participating physiotherapists used bracing devices as therapeutic treatment to knee OA patients pre- intervention (figure 4.11). Despite the fact that no session was recorded post-EBP workshop, the change was not significant ($p= 0.29$).

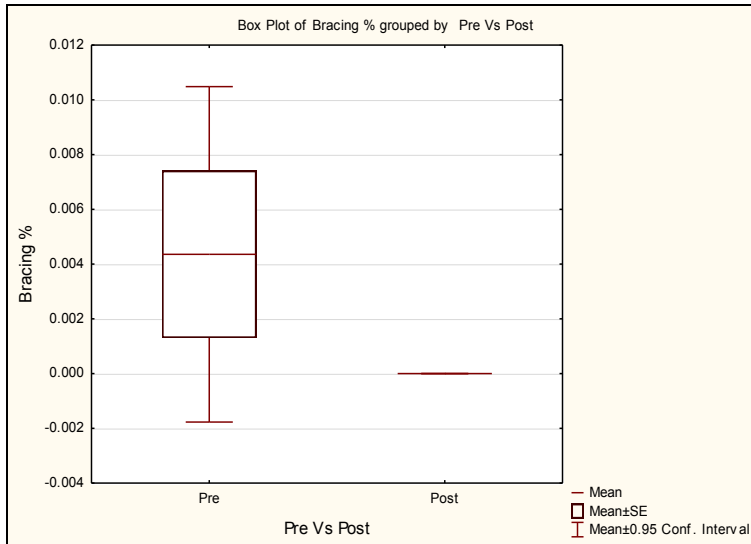


Figure 4. 11 Bracing Pre- Vs Post-intervention

4.5 Summary

In this chapter, all the results relating to the participating physiotherapists, physiotherapy practices pre- and post-intervention, and patients' characteristics were presented. No significant changes were noticed in the use of most of the modalities. A significant change was noticed in the use of weight-loss programs post-intervention. Participating physiotherapists used weight-loss programs *more* frequently following attendance at the EBP workshop (post-intervention). Another significant change was noticed in the use of patellar taping pos-intervention. Participating physiotherapists used patellar taping *less* frequently following attending the EBP workshop (post-intervention).

CHAPTER 5

Discussion

The main aim of this study was to promote the translation of evidence for physiotherapeutic interventions into clinical practice for the management of knee OA. An evidence-based practice (EBP) workshop was designed to provide physiotherapists working in public clinics in Jerusalem with the current evidence-based (EB) recommendations in a clinician-friendly synthesised manner to facilitate the selection of EBP techniques in the management of knee OA patients. The information for the EBP workshop was derived from the results of a systematic review conducted prior to commencement of the workshop (Chapter 2). This study also describes the current evidence for physiotherapy modalities used in the management of knee OA as recorded retrospectively by physiotherapists during feedback sessions prior to implementation of the intervention (EBP workshop). The effect of an EBP workshop on the physiotherapeutic treatment choices in the management of knee OA was evaluated. A positive change was noticed in the uptake of high-level evidence physiotherapeutic modalities in the management of knee OA patients amongst the participating physiotherapists following attendance of the EBP workshop. However, modalities with low-level evidence continued to be applied in clinical practice for knee OA patients after the EBP workshop was conducted. The main findings of the study are discussed in this chapter.

5.1 Physiotherapist demographics

The mean age of participating physiotherapists (32.7 years) represented a younger cohort of physiotherapists compared to physiotherapists treating knee OA patients from other countries. In a similar study, the mean age of physiotherapists treating knee OA patients was 47 years (Jamtvedt *et al.* 2008). Most of the participating physiotherapists were full-

time practitioners. The data was collected from public practices and patients were covered by government medical insurance. Physiotherapists working at private practices did not meet the inclusion criteria for this study. This exclusion may have affected the results relating to the use of specific modalities as physiotherapists from public clinics often have limited access to modalities which are not affordable for the government. In addition, physiotherapists in the public sector may also be less exposed to the marketing of workshops for specific modalities or devices. Medical insurances also provide physiotherapists with guided courses on standard approaches to manage patients and this may have influenced the selection of physiotherapy techniques post-intervention.

In this project, we considered the management of each patient independently in order to prevent bias when analysing patients according to the treating physiotherapists. Therefore, tracing each physiotherapist's results and correlating the results with other factors such as gender, age, degree, and years of experience was not among the objectives of this study. Future research should be conducted to consider the effect of these factors on physiotherapist's choices of modalities to treat knee OA patients.

5.2 Physiotherapy assessment

Physical examination and assessment tools such as ROM, VAS, functional tests, and the Oxford muscle strength scale were widely used by the participating physiotherapists in the initial assessment of knee OA patients. Physical examination and assessment tools were less frequently used during reassessment. Patient self-report outcome measures were used in 14% of physiotherapy sessions. The results showed that physiotherapists never used standard self-report outcome measure such as WOMAC or other global outcome measures indexes. Therefore, the clinical effect of physiotherapy treatments were not measured at regular intervals with standardized outcome measures. Outcome measurement should thus be addressed in either the undergraduate or postgraduate training programs to facilitate the appropriate application of outcome measurement for this patient population (Escobar *et al.*, 2002).

The poor usage of outcome measures amongst the participating physiotherapists may, however, also be due to a number of other factors. Firstly, time limitations to assess patients in public clinics due to the large number of patients treated per day may hinder the appropriate use of outcome measures on a regular basis. Physiotherapists in this sector may also need to be educated about the clinical utility of outcome measures and the usefulness of standardized measures to monitor response to treatment (Salaffi *et al.*, 2003). Consequently, campaigns to raise awareness about the importance of outcome measures and re-organisation of service delivery time management to allow time for adequate outcome measurement may be useful (Salaffi *et al.*, 2003).

5.3 Physiotherapy treatment aims

Knee OA is considered a major health problem due to its high prevalence, cost and impact on functional abilities (Srikanth *et al.*, 2005). Physiotherapy plays a role in the management of knee OA by reducing pain and disability and the need for surgery, which is related to the cost of care.

The findings of this study indicated that the treatment aims of the participating physiotherapists were to improve muscle strength, reduce pain, increase ROM and reduce or prevent functional disability (see Chapter 4.3.2). Achieving these aims may contribute towards enhanced activity and participation. Improvement in muscle strength is achievable by using exercises in treatment sessions, which was frequently prescribed by this sample of participating physiotherapists. Therefore, the aims stated by the physiotherapists correlated with prescribed interventions.

5.4 Physiotherapy modalities

5.4.1 Exercise

Aerobic exercises and home-based strengthening exercises are considered an effective physiotherapy modality to reduce pain and disability in knee OA patients (Roddy *et al.*, 2005). The goals of exercise therapy in knee OA are to optimise participation in social-,

domestic-, occupational- and recreational-related activities (Bennell and Hinman, 2011). Exercise plays a major role in improving physiological impairments associated with knee OA such as muscle weakness, limited joint range of motion, poor proprioception, poor balance and cardiovascular fitness (Jan *et al.*, 2005; Sekier *et al.*, 2008; Lange *et al.*, 2008).

In this study, all participating physiotherapists incorporated exercise as core treatment for knee OA patients prior to implementation of the intervention (EBP workshop). A small statistically insignificant decrease was noticed post-intervention (see Chapter 4, section 4.4.2). This small decrease may be due to contra-indications which hindered patients from participating in exercise. Exercise remained a core treatment in all physiotherapy sessions post-intervention. The current practice is thus desirable since all physiotherapists' implemented exercise, a modality which is strongly recommended in all clinical guidelines (CGs) (Chapter 2) and supported by high-quality evidence (Chapter 2). Such practice indicated that knee OA patients received a clinically-effective physiotherapy modality to improve muscle strength, improve overall body fitness, reduce pain and reduce activity and participation limitations. Future studies should also audit the physiotherapy management patterns over a longer period to establish whether the effect of the intervention is maintained.

The audit into the patient's records revealed that physiotherapists prescribed different types of exercises such as aerobic exercise, strengthening exercise, stretching exercise and hydrotherapy. In Chapter 2, one recommendation was formulated which composited the use of all types of exercise in the management of knee OA interventions. The results of this study indicate that physiotherapists inherently conformed to this recommendation in using high-level EB techniques even before attending the EBP workshop. However, the lack of evidence to support a specific type of exercise may have practice implications since therapists cannot be informed about the most optimal exercise approach or dosage for knee OA patients. Further research is thus required to ascertain the efficacy of different exercise approaches on outcomes in the management of knee OA.

5.4.2 Weight-loss programs

Obesity and being overweight are significant risk factors for the development and maintenance of knee OA which is not only characterized by progressive deterioration of articular cartilage of the synovial joints, but also multiply joint tissue, subchondral bone, synovium and meniscal deterioration (Zhang and Jordan 2008, Wang *et al.*, 2011). Weight-loss programs incorporated into knee OA management programs may therefore assist in reducing the OA progression rate and should be considered in all physiotherapy management programs for knee OA clients (Aaboe *et al.*, 2011). It is alarming to note that a mere 2% of physiotherapy sessions audited in this study (see Chapter 4, section 4.4.3) included advice/referral for weight-loss programs pre-intervention. This implies that physiotherapists may primarily focus on the core physiotherapy interventions related impairments such as pain, weakness or stiffness, and not weight-loss. A holistic approach is generally therefore not adopted in the management of knee OA patients in current clinical practices at public hospitals in Jerusalem. Focus on education about appropriate referral and advice for weight-loss should thus be increased.

The undesired practice noticed in this sample concerning weight-loss programs in the pre-intervention audit could be explained by a number of reasons such as a lack of knowledge about the effectiveness of weight-loss in disease management, lack of knowledge among the physiotherapists about how to decrease weight, unawareness of the positive psychological effects and the notion that exercise alone may contribute towards weight-loss (Okay *et al.*, 2009). This lack of advice or referral for weight-loss programs in this sample is in contrast with the referral patterns in developed countries, such as Norway, where physiotherapists included weight-loss programs in up to 80% of the treatment sessions (Jamtvedt *et al.*, 2008). This important strategy in the management of knee OA patients should therefore be addressed by continuing EBP workshops for physiotherapists in Jerusalem, and other developing countries.

The poor incorporation of weight-loss programs in the management of knee OA in Jerusalem could also highlight a shortcoming in education at undergraduate level. Therefore, revisions to both under- and postgraduate curricula and short courses are

required to foster the importance of weight-loss in the management of knee OA. A further challenge pertains to the EB referral route or strategy that should be advised by the physiotherapists. This issue also emphasises the importance of inter-professional care for patients with knee OA (RACGP, 2009). Further research into the development of specific inter-professional care pathways for knee OA patients is therefore warranted.

Following implementation of the EBP workshop (intervention), a significantly larger proportion of the treatment sessions incorporated weight-loss programs (see Chapter 4 section 4.4.3). This positive trend may be explained by the increased knowledge about the importance of weight-loss programs and the presentation of research evidence to support the incorporation of weight-loss programs in the physiotherapeutic management of knee OA patients. However, not all physiotherapists adopted weight-loss programs as a component of their management regimes for knee OA post-intervention and this indicates that further strategies and ongoing education may be required to facilitate the selection of EB strategies such as weight-loss programs. Future studies which incorporate longer duration educational programs and follow-up periods may however be necessary.

5.4.3 Self-management education programs (SMEPs)

Barlow et al. (2002) defined self-management as an “individual’s ability to manage the symptoms, treatment, physical and psychological consequences and lifestyle changes inherent to living with a chronic condition”. SMEPs are interactive, collaborative, and require the co-operation of multi-dimensional healthcare professionals (Kao et al., 2011). Kao et al. (2011) reported that the unique characteristic of SMEPs stems from emphasizing self-efficacy, self-monitoring, goal-setting, action-planning, decision-making, problem-solving and partnership between the views of the patient and the healthcare professional. The current practice of SMEPs amongst physiotherapists in Jerusalem is concerning (see Chapter 4, section 4.4). The pre-intervention audit revealed that self-management strategies were incorporated into a small proportion of the treatment sessions. This could be explained by the lack of knowledge about the psychological effectiveness of SMEPs in treating chronic conditions, the lack of skills to

create SMEPs advice or incomplete record-keeping pertaining to advice given to patients following management. Physiotherapists used SMEPs only in 10% of the physiotherapy interventions (See Chapter 4 section 4.4) after the EBP workshop. This is significantly lower than the findings of a study by Jamtvedt et al. (2008) who reported that 72% of the physiotherapists implemented SMEPs in treatment sessions. SMEPs require collaborative and inter-professional care and should be promoted to optimise patient outcomes and reduce cost of care. The incorporation of self-management strategies in clinical practice should thus be addressed at undergraduate, postgraduate and professional levels. Furthermore, physiotherapists may need to improve their record-keeping as this may have inadvertently affected the results of the audit.

5.4.4 Electrotherapy / manual therapy / massage/ thermotherapy/ acupuncture

- *Electrotherapy*

The findings of the evidence synthesis in Chapter 2 illustrated modest evidence to support the use of TENS for pain relief in patients with knee OA. In the current study, the participating physiotherapists used electrotherapy in 51% of physiotherapy sessions post-EBP workshop, compared to 53% before the EBP workshop. In a similar study conducted in England (Walsh and Hurley, 2009), 66% of the physiotherapists used electrotherapy to treat knee OA patients. In a similar study conducted in Norway, 47% of the physiotherapists used electrotherapy to treat knee OA patients (Jamtvedt et al., 2008). Therefore, the application of electrotherapy for knee OA in Jerusalem follows a similar pattern as physiotherapy practices in Norway, but is used less frequently than British physiotherapists.

The selection of electrotherapy did not significantly change after the EBP workshop. Considering that there is only modest evidence to support electrotherapy, the current management patterns may be reasonable to manage knee OA patients. Further research should be conducted to strengthen the evidence base for electrotherapy.

- *Manual therapy*

Manual therapies consist of a wide range of passive or active-assisted techniques that use manual techniques to improve mobility of tissues or relieve pain (NICE, 2008). The findings of the evidence synthesis in Chapter 2 illustrated that manual therapy was supported by a modest level of evidence. The NICE guideline (2008) considered manual therapy as an adjunctive to core treatment. Short-term beneficial effects were reported by French *et al.* (2011) in reducing pain and improving physical function in knee OA patients. In this study, the participating physiotherapists practiced manual therapy in 28% of physiotherapy sessions prior to the EBP workshop compared to 40% post-EBP workshop. In a similar study on knee OA, manual therapy was practiced by 60% of the physiotherapists in England (Walsh and Hurley 2009). Considering the current evidence base for manual therapy, application of manual therapy in 40% of all interventions may be justifiable until more defensible evidence becomes available.

- *Massage*

The finding of the evidence synthesis in Chapter 2 illustrated that the use of massage to treat knee OA was supported by weak evidence (RACGP, 2009). The aim of applying massage is to reduce pain and promote function through increasing the blood and lymph flow and decrease muscle tension and spasm (RACGP, 2009). A decrease in the number of physiotherapy sessions in which massage was used to treat knee OA was noticed after the EBP workshop. In this study, physiotherapists practiced massage in 16% of the physiotherapy sessions compared to 12% post-EBP workshop (See Chapter 4.4.6). Although the decrease was statistically significant, the trend of physiotherapists using this modality remains a concern and the relatively small number of subjects audited post-intervention may also have influenced the findings. The findings of this study compares to those of similar studies. Walsh and Hurley (2009) reported that 5% of physiotherapists used massage, while Jamtvedt *et al.* (2008) reported that 54% of physiotherapist used massage in treating knee OA patients. Therefore, further research is required to establish the use of massage therapy in the management of knee OA.

- *Acupuncture*

Acupuncture was not practiced by any of the physiotherapists to treat knee OA patients. A possible explanation for this finding could be that our sample comprised of physiotherapists practicing in public clinics since physiotherapists in private clinic did not meet the inclusion criteria. Government medical insurances do not cover acupuncture and this may explain why none of the physiotherapists in this study used this technique. Another explanation may be a cultural barrier as this is not common practice in this region. In similar studies, 64% and 21% of the physiotherapists reported that they used acupuncture to treat knee OA patients in England and Norway respectively (Walsh and Hurley 2009; Jamtvedt *et al.* 2008).

- *Thermotherapy*

The use of thermal modalities (heat and cryotherapy) was widely used in the management of knee OA patients (OARSI, 2008). The main aims of applying thermal modalities are to decrease pain, swelling, inflammation and muscle spasms (RACGP, 2009). The finding of the evidence synthesis in Chapter 2 illustrated that the use of thermotherapy was supported by a modest level of evidence. In this study, no changes were noticed in applying thermotherapy. Thermotherapy was practiced by 53% prior to the EBP workshop compared to 47% practiced thermotherapy to treat knee OA post-EBP workshop. In similar studies, 20% and 7% of physiotherapists used thermotherapy to treat knee OA patients (Walsh and Hurley 2009; Jamtvedt *et al.* 2008). The discrepancy in the results may be due to the small sample size of our study and characteristics of the sample which comprised of only physiotherapists practicing in the public sector.

5.4.5 Patellar taping

The aim of using patellar taping in the management of knee OA is to reduce pain by stabilizing the knee joint and shifting the distribution of stress, thereby reducing weight-bearing in the knee joint (RACGP, 2009; Page *et al.*, 2011). The findings of the evidence synthesis in Chapter 2 illustrated that the use of patellar taping was supported by a modest level of evidence. The results of the current study showed that taping was used in 37% of the physiotherapy sessions prior the EBP workshop compared to 17% post-EBP

workshop (see Chapter 4). The results of the current study concurred with similar studies, where 5% and 3% of physiotherapists were found to use taping in England and Norway, respectively (Walsh and Hurley, 2011; Jamtvedt *et al.*, 2008). The statistically significant decrease of using patellar taping in the current study could possibly be explained by the lack of tape in the public clinics.

5.4.7 Bracing

In the management of knee OA, braces are often used to increase the stability of the knee joint and support the weak muscles (RACGP, 2009). A wide variety of braces are available for knee OA (Page *et al.*, 2011). From the results of the systematic review (Chapter 2), the recommendation to use bracing in the management of knee OA was supported by weak evidence. The current study revealed that less than 1% of physiotherapy sessions audited pre-intervention contained reference to the use of bracing to treat knee OA, coinciding with the lack of evidence available. In addition, an absence in the use of bracing was noticed after the EBP workshop. The findings of the current study concurred with a study by Walsh and Hurley (2009) which found that only 1% of the therapists used bracing to treat knee OA patients. Jamtvedt *et al.* (2008) reported that 8% of the physiotherapists used bracing to treat knee OA in most of the physiotherapy sessions.

5.5 Study limitations

Limitations to the current study were as follows:

- The included articles from the CGs were not examined for quality in this study, inadvertently affecting confidence in the accuracy of the findings presented in the study.
- The sample of this study consisted of physiotherapists practicing in public clinics, limiting the generalisability of the current study findings to private settings.
- The relatively small sample size included in this study limits the extrapolation of the findings to other countries or populations.
- Record-keeping amongst physiotherapists should be improved as the lack of skills in record-keeping may have affected accurate evaluation of clinical practice.

- The quasi-experimental design of the translation phase of this study is considered as a limitation.
- Using an EB workshop is considered a limitation for this study since there is no evidence of EB workshop method in translating knowledge into clinical practice.
- Possibility of the researcher bias and the influence of the workshop content, presented by the principal researcher on the participants' actions at post-test.

5.6 Recommendations for future research

From the results of the current study, the following recommendations can be postulated for the EB physiotherapy management of knee OA:

- All physiotherapists participating in the current study were from public clinics. Studies which include a representative sample of physiotherapists should be conducted to ascertain if the current findings are generalisable to other populations or countries.
- In the current study, only physiotherapists that treated at least five knee OA patients in the last three months were included. Studies which focused on all the physiotherapists who are exposed to treat knee OA should be considered.
- The current study was designed to conduct a 3-month follow-up on the physiotherapists following implementation of the intervention (EBP workshop). Studies which include longer follow-up time frames may shed light on the long-term effect of EBP workshops on the uptake of evidence into clinical practice.
- The current study focused on the translation of EB physiotherapy interventions into clinical practice for the management of knee OA patients. Studies which include rehabilitation teams as a target population could facilitate the coordination between the rehabilitation team and promote inter-professional care. Therefore, future studies should evaluate EB pathways of care.

CHAPTER 6

Conclusion

The main aim of this research project was to promote the translation of EBP physiotherapeutic interventions into the management of patients with knee OA. To achieve this aim, a synthesis of all knee OA evidenced-based clinical guidelines (EBCGs) was initially conducted. Thereafter, a retrospective audit of patients' records who attended physiotherapy for knee OA, three months prior to an educational EBP workshop and three months post the workshop, was conducted. The initial audit (pre-intervention) revealed that the participating physiotherapists utilized one high-quality EB modality, namely exercise, as a core management strategy in knee OA, but did not frequently implement other high-quality EB modalities such as self-management and weight-loss programs. Following the presentation of the EBP workshop, a statistically significant increase ($p=0.008$) in the implementation of weight-loss (high EB modalities) programs in the management of knee OA was noted. This result illustrates that an EBP educational workshop may be effective in promoting the uptake of EB modalities in the management of knee OA patients. Further larger studies with longer follow-up periods are, however, required.

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APPENDICES

Appendix 1: Primary and secondary research cited in each guideline

Author	Study design	AAOS	RCAGP	OARSI	NICE	Intervention
Roddy 2005	SR	√	√	√	√	exercise
Devos-Comby 2006	SR		√			exercise
Fransen 20006	SR		√		√	exercise
Brosseau 2006 A	SR		√			exercise
Cochrane 2005	RCT		√	√		aquatic
Hinman 2007	RCT		√			aquatic
Fransen 2007	RCT		√		√	aquatic
Christensen 2005	RCT	√		√		weight loss
Christensen 2007	SR	√	√	√	√	weight loss
Jamtvedt 2008	SR			√		weight loss
Witt 2005	RCT	√	√	*	√	acupuncture
Ezzo 2001	SR	√		√		acupuncture
Foster 2007	RCT	√		√		acupuncture
White 2007	SR	√	√	√	√	acupuncture
Kwon 2006	SR	√	√	√		acupuncture
Yurtkuran 2007	RCT	√	√		√	acupuncture
Vas 2006	RCT		√			acupuncture
Manheimer 2007	MA	√		√	√	acupuncture
Moe 2007	SR			√		acupuncture
Vas 2007	SR			√		acupuncture
White 2007	SR	√		√	√	acupuncture
Yamashita 2006	SR			√		acupuncture
Brosseau 2003	SR		√	√	√	thermo
Yurtkuran 1999	RCT			√		thermo
Clarke 1974	RCT			√		thermo
Martin 1998	non comparative				√	thermo
Warden 2008	SR	√				taping
Hinman 2003	RCT	√	√		√	taping
Cushnaghan 1994	RCT	√	√		√	taping
Hinman 2003 b	RCT	√	√		√	taping
Quilty2003	RCT			√	√	taping
Osiri 2000	SR		√	√	√	TENS
Paker 2006	RCT		√		√	TENS
Adedoyin 2005	RCT		√			TENS
Brosseau 2004	SR			√		TENS
Bjordan 2007	SR			√	√	TENS
Cheing 2002	RCT				√	TENS

Cheing and Hui-Chan 2004	RCT				√	TENS
Tascioglu 2004	RCT		√		√	LASER
Bjordal 2007	SR		√			LASER
Brosseau 2006 B	SR				√	LASER
Yurtkuran 2007	RCT				√	LASER
Robinson 2006	SR		√		√	US
McCarthy 2006	SR		√		√	SWD
Hulme 2002	SR		√		√	SWD
Bennell 2005	RCT				√	manual
Deyle 2000	RCT		√		√	manual
Deyle 2005	RCT		√		√	manual
Tucker 2003	RCT				√	manual
Moss 2007	RCT				√	manual
Perlman 2006	RCT		√		√	massage
Warsi 2003	SR	√		√		SMEP
Chodosh 2005	SR	√		√		SMEP
Devos-Comby	SR		√			SMEP
Nunez 2006	RCT		√		√	SMEP
Buszewicz 2006	RCT		√		√	SMEP
Chodosh 2006	SR	√		√	√	SMEP
Superio-Cabuslay 1996	SR				√	SMEP
Heuts 2005	RCT				√	SMEP
Calfas 1992	RCT				√	SMEP
Victor and Triggs 2005	RCT				√	SMEP
Maisiak et al. 1996	RCT				√	SMEP
Brouwer 2008	SR	√	√	√	√	brace & assistive device
Reilly 2006	SR		√			brace & assistive device
Kirkley 1999	RCT	√		√		brace & assistive device
Keating 1993	RCT			√		brace & assistive device
Toda 2001	RCT	√		√		brace & assistive device
Maillefert 2001	RCT	√		√	√	brace & assistive device
Hay 2006	RCT		√		√	multimodal

Appendix 2: NHMRC Evidence Hierarchy

Level	Intervention
I	A systematic review of level II studies
II	A randomized controlled trial
III-1	A pseudo-randomized controlled trial (i.e. alternate allocation or some other method)
III-2	A comparative study with concurrent controls: <ul style="list-style-type: none"> ▪ Non-randomized, experimental trial ▪ Cohort study ▪ Case-control study ▪ Interrupted time-series with a control group
III-3	A comparative study without concurrent controls: <ul style="list-style-type: none"> ▪ Historical control study ▪ Two or more single arm study ▪ Interrupted time series without a parallel control group
IV	Case series with either post-test or pre-test/post-test outcomes

Appendix 3: Definition of NHMRC grades of recommendations

Grade of recommendation	Description
A	Body of evidence can be trusted to guide practice
B	Body of evidence can be trusted to guide practice in most situations
C	Body of evidence provides some support for recommendation(s) but care should be taken in its application
D	Body of evidence is weak and recommendation must be applied with caution

Appendix 4: Knee OA data capturing form

Knee OA Data capturing form

Practice code:

Section I: Personal Data

Code	
Gender	
1. Male	2. Female
DOB:	
Marital status	
1. Single	3. Divorced
2. Married	4. Widow
Weight :	
Occupation	
Time of first episode	
Number of Physiotherapy episodes of care for knee OA in the last 5 years	
Number of treatments sessions in the last episode	

Section II:

Other forms of treatments or interventions

.....

.....

.....

.....

How was the diagnosis of knee OA made?

X-ray	
Clinical examinations	

Other:

.....

Affected side

1. Right side

2. Left side

3. Both sides

Section III: Physiotherapy Treatment Aim

Reduce disability	
Improve muscle strength	
Increase ROM	
Improve balance	
Improve quality of life	
Reduce pain	
Delay surgery	

Other:

.....

Main finding of physical examination

Knee ROM	Yes	No	Findings:
Functional test	Yes	No	Findings:
Pain score	Yes	No	Findings:
Muscle strength	Yes	No	Findings:

Standard outcome measures (initially)

VAS	Yes	No	Findings:
WOMAC	Yes	No	Findings:
Patient self report	Yes	No	Findings:
ROM	Yes	No	Findings:

Standard outcome measures (reassessment)

VAS	Yes	No	Findings:
WOMAC	Yes	No	Findings:
Patient self report	Yes	No	Findings:
ROM	Yes	No	Findings:

Patient's current status:

1. DC 2. Stopped treatment 3. Still receiving treatment

Physiotherapy modalities (1st treatment)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight-loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Physiotherapy modalities (2nd session)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight-loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Physiotherapy modalities (3rd session)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight-loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Physiotherapy modalities (4th session)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight-loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Physiotherapy modalities (5th session)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight-loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Physiotherapy modalities (6th session)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight-loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Physiotherapy modalities (7th session)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight-loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Physiotherapy modalities (8th session)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight-loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Physiotherapy modalities (9th session)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight-loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Physiotherapy modalities (10th session)

Physiotherapy modalities	Yes	No	Description
Self-management			
Exercise			
Weight- loss			
Electrotherapy			
Manual therapy			
Massage			
Acupuncture			
Thermotherapy			
Patellar taping			
Bracing and assistive device			

Other:.....

Appendix 5: Physiotherapist's Data Capturing Form

Section I: Personal Data

Code	
Gender:	
1. Male	2. Female
DOB:	
Qualification:	
Years of experience:	

In what type of practice setting do you currently work as a physical therapist?

- ☐ Public practice (*general hospitals, rehabilitation centers*)
- ☐ Private practice (*private clinics, home care*)
- ☐ Both public and private

How many patients on average do you treat with knee OA per week?

.....

Are you currently working full-time or part-time as a physical therapist?

- ☐ Full-time (*greater than 35-40 h/wk*)
- ☐ Part-time (*less than 35 h/wk*)

Which year did you receive your undergraduate degree in physical therapy?

.....

How many years have you been practicing physical therapy?

(Please choose one category only.)

- ☐ Less than one year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ More than 15 years

How many years have you been treating clients with knee OA?

(Please choose one category only.)

- ☐ Less than one year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ More than 15 years

Appendix 6: Informed consent pre-intervention (Arabic)

عنوان مشروع البحث :

العلاج الطبيعي المبني على الادلة لمرضى التهاب المفاصل في مفصل الركبة: ترجمة المعارف

رقم لجنة اخلاقيات البحث الطبي:

الرقم المرجعي: 102-03-11

الباحث الرئيسي: حسام دنديس (بكالوريوس علاج طبيعي)

العنوان : القدس صندوق بريد 20970

رقم الهاتف : 0546673008

انتم مدعوون للمشاركة في مشروع بحثي. يرجى أن تأخذ بعض الوقت لقراءة المعلومات المقدمة هنا ، والتي تشرح تفاصيل هذا المشروع تماما. و يرجى سؤال فريق البحث أي أسئلة عن أي جزء من هذا المشروع. من المهم جدا ان تكون راضيا تماما وأن تفهم بوضوح ما يستتبع هذا البحث ، وكيف يمكن إشراك سجلك الطبي. مشاركتكم طوعية تماما أيضا ، وأنت حر في أن ترفض المشاركة ، وهذا لن يؤثر عليك أو جلسة العلاج سلبا بأي شكل من الأشكال. أنت أيضا حر في الانسحاب من الدراسة في أي لحظة ، حتى لو وافقت مبدئيا على المشاركة.

قد اعتمدت هذه الدراسة من قبل لجنة الصحة أخلاقيات البحوث في جامعة ستيلينبوش ، وسوف تجري وفقا للمبادئ التوجيهية الأخلاقية ومبادئ الإعلان العالمي لهلسنكي.

ما هي هذه الدراسة البحثية حول ؟

الهدف من هذا المشروع البحثي هو دراسة نوعية تدخل العلاج الطبيعي لمرضى التهاب العظم والمفاصل في الركبة ، وتوفير العلاج الطبيعي مع أفضل الأدلة المتاحة لتحسين الخيارات العلاجية لمرضى التهاب العظم والمفاصل في الركبة.

لماذا دعيت إلى المشاركة؟

دعيت للمشاركة في هذا المشروع البحثي لانك عولجت كمريض لالتهاب المفاصل في الركبة خلال ال 3 أشهر السابقة من قبل أخصائي العلاج الطبيعي الذي وافق على المشاركة في هذه الدراسة البحثية.

ما هي مسؤولياتك ؟

مسؤوليتك هي فقط إعطاء الموافقة يجب عليك الموافقة على المشاركة في الدراسة. وسوف يقوم الباحث بمراجعة سجلك الطبي. البيانات المراجعة ستشمل بيانات المريض الديموغرافية (العمر ، الجنس ، الوضع العائلي ، والوزن) ، ونتائج الفحص الرئيسية ، وعوامل المخاطر ، وعدد من جلسات العلاج ، ومدة الجلسة العلاجية ونوعية العلاجات المقدمة.

من لديهم إمكانية الوصول إلى السجلات الخاصة بك؟

ستعامل جميع المعلومات التي تم جمعها مع هذا المشروع على أنها سرية ، وسوف تكون محمية. إذا تم استخدام هذه المعلومات في الرسالة أو نشر ، نضمن عدم الكشف عن هوية المشاركين. فقط الباحث وفريقه سوف يتمكنون من الوصول إلى المعلومات. وستبقى هذه السجلات بشكل آمن في إدارة العلاج الطبيعي ، جامعة ستيلينبوش ، جنوب أفريقيا.

متى سيتم تدمير السجلات الخاصة بك؟

سيتم تدمير السجلات بعد خمس سنوات .

هل سوف يكون هنالك مردود مالي للمشاركة في هذه الدراسة وهل هناك أي التكاليف للمشاركة؟
أنت لن تدفع للمشاركة في الدراسة. لن يكون هناك أي التكاليف التي ينطوي عليها بالنسبة لك إذا كنت لا تأخذ جزءا.

هل هناك أي مخاطر في المشاركة في هذا البحث؟

هناك الحد الأدنى من المخاطر التي ينطوي عليها المشاركة في هذا المشروع البحثي.

هل هناك أي شيء آخر يجب أن تعرفه

1 يمكنك الاتصال حسام دنديس خليوي : 0546673008 إذا كان لديك أي استفسارات أخرى أو واجهتك أية مشاكل.

2 سوف تتلقى نسخة من هذه المعلومات واستمارة الموافقة على كشف السجلات الخاصة بك.

موافقة مشارك

بالتوقيع أدناه ، أنا (اسم المشارك)..... اوافق على المشاركة في دراسة بحثية بعنوان "الأدلة المستندة إلى إدارة الركبة هشاشة العظام العلاج الطبيعي : ترجمة المعارف دراسة "

أعلن ما يلي :

1. لقد قرأت أو قد قرأ لي هذه المعلومات واستمارة الموافقة و هي مكتوب في اللغة التي افهمها أنا بطلاقة ومريحة.
2. قد أتيت لي فرصة لطرح الأسئلة ولقد تمت الإجابة على جميع أسئلتني بشكل كاف.
3. أنا أفهم أن من يشارك في هذه الدراسة هو طوعي وأنا لم يضغط علي لاشراك.
4. الانسحاب من الدراسة في أي وقت ممكن ،لا يوجد مانع من الانسحاب في اي وقت .
5. أسمح للباحث بمراجعة السجلات الطبية لدي كجزء من هذا المشروع البحثي.

وقعت في (مكان)..... في (التاريخ)..... 2011.

توقيع الشاهد

توقيع المشارك

إعلان من قبل المحقق

أنا (الاسم)..... أعلن ما يلي :

- وأوضح أنا ان المعلومات الواردة في هذا المستند إلى.....
- اعطي له / لها الفرصة لطرح الأسئلة وأخذ الوقت الكافي للرد عليها.
- أنا مقتنع بأنه / ها فهم بشكل كاف جميع جوانب البحث ، كما نوقش أعلاه

وقعت في (مكان)..... في (التاريخ)..... 2011.

Appendix 7A: Program of EBP workshop

TIME	TOPIC
Presenter	Mr. Hussam Dandees
9:00 - 9:30	Registration
9:30 – 9:45	Introduction: Revision of study aim and background
9:45- 10:15	Principles of EBP, Evidence hierarchies and EB Guidelines
10:15-10:45	Presentation of audit findings: Knee OA physiotherapeutic treatments used in Jerusalem
10:45- 11:30	EB physiotherapeutic recommendations for knee OA patients
11:30- 11:45	Tea break
11:45- 12:15	EB physiotherapeutic recommendations for knee OA patients: Case study 1
12:15- 13:00	Lunch
13:00- 14:00	Barriers and facilitators of the use of EB knee OA interventions
14:00- 14:30	EB physiotherapeutic recommendations for knee OA patients: Case study 2
14:30-16:00	Adaptations/Revision of Knee OA EB physiotherapy recommendations
16h00-16h30	Closing

Appendix 7B: Program of EBP workshop

Evidence- based knee osteoarthritis physiotherapeutic management

Husam M Dandees
Stellenbosch University
Physiotherapy Division

Abbreviations

- AAOS: American Association of Orthopaedic Surgeons
 - CI: Confidence Interval
 - CGs: Clinical Guidelines
 - EB: Evidence-based
 - EBP: Evidence-based Practice
 - LoE: Level of Evidence
 - MA : Meta-Analysis
 - MCII: Minimal Clinically Important Improvement
 - NHMRC: National Health and Medical Research Council (Australia)
 - RACGP: Royal Australian Collage of General Practitioners
 - NHS: National Health Service (England and Wales)
 - NICE: National Institute for Health and Clinical Excellence (UK)
-

Abbreviations

- ❑ OA: Osteoarthritis
 - ❑ OARSI: Osteoarthritis Research Society International
 - ❑ PEMF: Pulsed Electromagnetic Field
 - ❑ RCTs : Randomised Controlled Trials
 - ❑ ROM: Range of Motion
 - ❑ SMD: Standard Mean Deviation
 - ❑ SMEPs: Self -Management Education Programs
 - ❑ SOR: Strength of Recommendation
 - ❑ SR: Systematic Review
 - ❑ VAS: Visual Analogue Scale
 - ❑ WOMAC: Western Ontario and McMaster Osteoarthritis Index
-

Aim of the study

The primary objectives of this study were to:

- ❑ 1) describe the range of EB physiotherapeutic interventions in the management of knee OA as documented in current clinical guidelines.
 - ❑ 2) develop composite clinical recommendations for a specific group of users working in Jerusalem.
-

Background

- Osteoarthritis (OA) is the most common disease affecting the synovial joints (Roddy *et al.* 2005).
 - A wide range of passive and active physiotherapeutic interventions such as self management education programs, physical exercise, weight loss, thermotherapy, electrotherapy, manual therapy, massage, acupuncture, bracing and assistive devices are commonly used to treat patients with knee OA.
-

Background

- The evidence of the effectiveness of physiotherapeutic interventions in knee OA is synthesised in the currently available published clinical guidelines (AAOS (2008); RACGP (2009); NICE (2008); OARSI (2008))
-

Background

- Guidelines provide readily accessible, time-efficient and interpretable references for clinicians, as they summarise available literature to answer a range of clinical questions (van der Wees *et al.* 2008).
-

Background

- guidelines should be specific to the local context of the target users
-

Objectives

The primary objectives of this synthesis were:

- ❑ To describe the knee OA physiotherapy EB management as indicated in current EB knee OA clinical guidelines.
 - ❑ To review the evidence grading systems applied in EB guidelines and ascertain the level of evidence for the physiotherapeutic interventions for knee OA.
-

Objectives

- ❑ To assess the methodological quality of the EB knee OA guidelines.
 - ❑ To synthesis the evidence into a composite clinical recommendations for the physiotherapeutic management of knee OA.
-

Principles of EBP, Evidence hierarchies and EB Guidelines

Husam M Dandees
Stellenbosch University
Physiotherapy Division

Definition

- **"The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research"**

(Sackett et al,1996)

EBP Guidelines

- Treatment of osteoarthritis of the knee (non-arthroplasty) (2008).

This guideline adopted by the American Academy of Orthopaedic Surgeons. Recommendations of this guideline covered pharmacological and non-pharmacological treatments up to but not including, knee replacement. Twenty-two recommendations were documented. The guideline was available in a full text version.

EBP Guidelines

- The Guideline for the non-surgical management of Hip and Knee Osteoarthritis (2009).

This guideline was published by The Royal Australian College of General Practitioners and approved by the NHMRC. This guideline provided recommendations related to the non-surgical management of hip and knee OA.

EBP Guidelines

- ❑ Osteoarthritis Research Society International (OARSI) Recommendations for the Management of Hip and Knee Osteoarthritis (2008-2010).

OARSI recommendations are based on three publications of the OARSI group. The first part was a critical appraisal of existing treatment guidelines and a systematic review of current research evidence.

EBP Guidelines

- ❑ The second part was the OARSI evidence-based, expert consensus guidelines. The final publication was based on changes in evidence following a systematic cumulative update of research published between January 2009 and January 2010. Recommendations of OARSI covered the pharmacological, non-pharmacological and surgical interventions for hip and knee OA.
-

EBP Guidelines

- ❑ Osteoarthritis: The National Clinical Guideline for Care and Management in Adults (2008)

This guideline was published by the Royal Collage of Physicians and funded by National Institute for Health and Clinical Excellence (NICE).

Osteoarthritis: The National Clinical Guideline for Care and Management in Adults (2008)

This guideline provided recommendations on pharmacological and non-pharmacological interventions as well as referral criteria for surgery in the management of OA. In addition, recommendations relating to the evidence for cost-effectiveness of the interventions were included.

EBP hierarchies

- ❑ The process for grading the recommendations based on the collected evidence varies between the included guidelines.
- ❑ In this study, the NHMRC evidence hierarchy and grading of recommendations were used.

NHMRC Evidence Hierarchy

Level	Intervention
I	A systematic review of level II studies
II	A randomised controlled trial
III-1	A pseudorandomised controlled trial (i.e. alternate allocation or some other method)
III-2	A comparative study with concurrent controls: ? Non-randomised, experimental trial ? Cohort study ? Case-control study ? Interrupted time series with a control group
III-3	A comparative study without concurrent controls: ? Historical control study ? Two or more single arm study ? Interrupted time series without a parallel control group
IV	Case series with either post-test or pre-test/post-test outcomes

NHMRC recommendation grading

Grade of recommendation	Description
A	Body of evidence can be trusted to guide practice
B	Body of evidence can be trusted to guide practice in most situations
C	Body of evidence provides some support for recommendation(s) but care should be taken in its application
D	Body of evidence is weak and recommendation must be applied with caution

Methods to synthesis recommendations

1. Evidence based for synthesised recommendations
2. Grading of recommendations
3. Wording of recommendations

Grading of recommendations

- Grading recommendations for local context was formulated according to the new guideline recommendation matrix developed in line with the NHMRC

Key component	Definition
Evidence base	A: One or more level I or several level II studies
	B: One or two Level II studies or SR/several Level III studies
	C: One or two Level III studies or Level I or II studies
	D: Level IV studies or Level I to III studies/SRs
Consistency	A: Recommendations in all guidelines consistent
	B: Recommendations in most guidelines consistent and inconsistency can be explained
	C: Some inconsistency, reflecting genuine uncertainty around question
	D: Evidence is inconsistent
	N/A Not applicable
Clinical impact	A: Effect Size considered (large effect size $d \geq 0.8$)
	B: Effect Size considered (moderate effect size $d \leq 0.5$)
	C: Effect Size considered (Small effect size $d \geq 0.2$)
	D: Not Reported
Generalisability	A: Evidence directly generalisable to target population
	B: Evidence directly generalisable to target population with some caveats
	C: Evidence not directly generalisable to the target population but could be sensibly applied
	D: Evidence not directly generalisable to target population and hard to judge whether it is sensible to apply
Applicability	A: Evidence directly applicable to Middle East healthcare context
	B: Evidence applicable to Middle East healthcare context with few caveats
	C: Evidence probably applicable to Middle East healthcare context with some caveats
	D: Evidence not applicable to Middle East healthcare context

Current Practice for knee OA (Research project)

Husam Dandees
Stellenbosch University
Physiotherapy Division

Exercise

☐ 99% of PT sessions.

Self-management

- ☐ 7% of PT sessions.

Weight loss

- ☐ 2% of PT sessions.
- ☐ Norway, 72% of PT applied weight loss in up to 80% of the treatment sessions (Jamtvedt *et al.* 2008)

ET

- ☐ 54% of PT sessions.
 - ☐ Norway, 47% of PT sessions (Jamtvedt *et al.* 2008).
 - ☐ England, 66% of PT sessions (Walsh and Hurley 2009).
-

Manual therapy

- ☐ 28% of PT sessions.
 - ☐ 60% and 40 % in England and Norway respectively (Walsh and Hurley 2009) (Jamtvedt *et al.* 2008).
-

Massage

- ☐ 15 % of PT sessions.
 - ☐ 5% used massage in England (Walsh and Hurley 2009).
 - ☐ 54% used massage in all physiotherapy session in Norway (Jamtvedt *et al.* 2008).
-

Acupuncture

- ☐ 0% of PT sessions.
 - ☐ 64% and 21% of the physiotherapists reported that they used acupuncture to treat knee OA patients in England and Norway respectively (Walsh and Hurley 2009) (Jamtvedt *et al.* 2008).
-

Thermotherapy

- ❑ 52% of PT sessions.
 - ❑ In similar studies, 20% and 7% of physiotherapists used thermotherapy to treat knee OA patients (Walsh and Hurley 2009) (Jamtvedt *et al.* 2008).
-

Taping

- ❑ 34% of PT sessions.
 - ❑ 5% and 3% of physiotherapists were found to use taping in England and Norway respectively (Walsh and Hurley. 2011; Jamtvedt *et al.* 2008).
-

Bracing

- 0.4% of PT sessions.
 - 1% and 8% of physiotherapists were found to use bracing in England and Norway respectively (Walsh and Hurley. 2011; Jamtvedt *et al.* 2008).
-

EB physiotherapeutic recommendations for knee OA patients (Research Project)

H Dandees
Stellenbosch University
Physiotherapy Division

Exercise

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
AAOS(2008)	1.We recommend patients with symptomatic OA of the knee be encouraged to participate in low-impact aerobic fitness exercises 2. We suggest quadriceps strengthening for patients with symptomatic OA of the knee. 3. Range of motion/flexibility exercises are an option for patients with symptomatic OA of the knee.	1.Level of evidence: I Grade of Recommendation: A 2.Level of evidence: II Grade of Recommendation: B 3.Level of evidence: V Grade of Recommendation: C
Guideline for the non-surgical management of hip and knee osteoarthritis(2009)	There is good evidence to support GPs recommending land based exercise for people with OA of the hip and knee	Grade of Recommendation: B
OARSI (2008)	Patients with hip and knee OA should be encouraged to undertake, and continue to undertake, regular aerobic, muscle strengthening and range of motion exercises	Level of evidence: I Grade of Recommendation: A SOR= 96% (95% CI 93-99)
Osteoarthritis (2008)	Exercise should be a core treatment for people with osteoarthritis, irrespective of age, comorbidity, pain severity or disability. Exercise should include: Local muscle strengthening General aerobic fitness	?

Weight loss

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
AAOS(2008)	We recommend patients with symptomatic OA of the knee, who are overweight (as defined by a BMI>25), should be encouraged to lose weight (a minimum of five percent (5%) of body weight) and maintain their weight at a lower level with an appropriate program of dietary modification and exercise.	Level of evidence: I Grade of Recommendation: A
Guideline for the non-surgical management of hip and knee osteoarthritis(2009)	There is good evidence to support GPs recommending weight reduction for obese patients with OA of the knee.	Grade of Recommendation: B
OARSI (2008)	Patients with hip and knee OA, who are overweight, should be encouraged to lose weight and maintain their weight at a lower level.	Level of evidence: I Grade of Recommendation: A SOR=96% (95% CI 92-100)
Osteoarthritis (2008)	Interventions to achieve weight loss should be a core treatment for people who are obese or Overweight	?

SMEPs

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
AAOS(2008)	We suggest patients with symptomatic OA of the knee be encouraged to participate in self-management educational programs, such as those conducted by the Arthritis Foundation, and incorporate activity modifications into their lifestyle.	Level of evidence: II Grade of Recommendation: B
Guideline for the non-surgical management of hip and knee osteoarthritis(2009)	There is some evidence to support GPs recommending self management education programs for treatment of OA of the hip and knee.	Grade of Recommendation: C
OARSI (2008)	All patients with hip and knee OA should be given information access and education about the objectives of treatment and the importance of changes in lifestyle, exercise, pacing of activities, weight reduction, and other measures to unload the damaged joint(s). The initial focus should be on self help and patient-driven treatments rather than on passive therapies delivered by health professionals. Subsequently emphasis should be placed on encouraging adherence to the regimen of non-pharmacological therapy	Level of evidence: I Grade of Recommendation A SOR= 97% (95% CI 95-99)
Osteoarthritis (2008)	Healthcare professionals should offer all people with clinically symptomatic osteoarthritis advice on the following core treatments: _ access to appropriate information _ activity and exercise _ interventions to effect weight loss if overweight or obese	?

Thermotherapy

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
Guideline for the non-surgical management of hip and knee osteoarthritis(2009)	There is some evidence to support GPs recommending cold therapy to treat symptoms of OA.	Grade of Recommendation: C
OARSI (2008)	Some thermal modalities may be effective for relieving symptoms in hip and knee OA.	Level of evidence: I Grade of Recommendation: A SOR= 64% (95% CI 60-68)
Osteoarthritis (2008)	The use of local heat or cold should be considered as an adjunct to core treatment.	?

Electrotherapy

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
Guideline for the non-surgical management of hip and knee osteoarthritis (2009)	<p>1. There is some evidence to support GPs recommending use of TENS for at least 4 weeks for treatment of OA of the knee.</p> <p>2. There is weak evidence to support GPs recommending low level laser therapy for short term treatment of OA of the knee.</p> <p>3. There is some evidence to suggest that therapeutic ultrasound is of no benefit in treating OA of the knee or hip. GPs could inform patients about lack of evidence of benefit over placebo.</p> <p>4. There is good evidence to suggest that electromagnetic field or electric stimulation interventions are of no benefit in the treatment of knee OA. GPs could inform patients about lack of evidence of benefit over placebo.</p>	<p>1. Grade of Recommendation: C</p> <p>2. Grade of Recommendation: D</p> <p>3. Grade of Recommendation: C</p> <p>4. Grade of Recommendation: C</p>
OARSI (2008)	Transcutaneous electrical nerve stimulation (TENS) can help with short-term pain control in some patients with hip or knee OA.	Level of evidence: IA SOR: 58% (95% CI 45-72)
Osteoarthritis (2008)	Healthcare professionals should consider the use of transcutaneous electrical nerve stimulation (TENS) as an adjunct to core treatment for pain relief.	?

Manual therapy

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
Osteoarthritis (2008)	Manipulation and stretching should be considered as an adjunct to core treatment, particularly for osteoarthritis of the hip	?

Massage

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
Guideline for the non-surgical management of hip and knee osteoarthritis (2009)	There is weak evidence to support GPs recommending massage therapy for treatment of OA of the knee or hip	Grade of Recommendation: D

Accupuncture

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
AAOS(2008)	We are unable to recommend for or against the use of acupuncture as an adjunctive therapy for pain in patients with symptomatic OA of the knee.	Level of evidence: I and II Grade of Recommendation: inconclusive
Guideline for the non-surgical management of hip and knee osteoarthritis (2009)	There is some evidence to support GPs recommending acupuncture for treatment of OA of the knee.	Grade of Recommendation: C
OARSI(2008)	Acupuncture may be of symptomatic benefit in patients with knee OA.	Level of evidence: I Grade of Recommendation: A SOR= 59% (95% CI 47-71)
Osteoarthritis (2008)	Electro-acupuncture should not be used to treat people with osteoarthritis	?

Taping

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
AAOS(2008)	We suggest patients with symptomatic OA of the knee use patellar taping for short term relief of pain and improvement in function	Level of evidence: II Grade of Recommendation: B
Guideline for the non-surgical management of hip and knee osteoarthritis(2009)	There is weak evidence to support GPs recommending patellar taping for treatment of OA of the knee.	Grade of Recommendation: C

Bracing

Guideline	Recommendation	Level of evidence/ Grade of Recommendation
AAOS (2008)	<ol style="list-style-type: none"> 1. We suggest lateral heel wedges not be prescribed for patients with symptomatic medial compartmental OA of the knee. 2. We are unable to recommend for or against the use of a brace with a valgus directing force for patients with medial uni-compartmental OA of the knee. 3. We are unable to recommend for or against the use of a brace with a varus directing force for patients with lateral uni-compartmental OA of the knee. 	<ol style="list-style-type: none"> 1.LoE: II GOR: B 2. LoE: II GOR: Inconclusive 3. LoE: V GOR: Inconclusive
OARSI (2008)	<ol style="list-style-type: none"> 1. Walking aids can reduce pain in patients with hip and knee OA. Patients should be given instruction in the optimal use of a cane or crutch in the contralateral hand. Frames or wheeled walkers are often preferable for those with bilateral disease. 2. In patients with knee OA and mild/moderate varus or valgus instability, a knee brace can reduce pain, improve stability and diminish the risk of falling. 3. Every patient with hip or knee OA should receive advice concerning appropriate footwear. In patients with knee OA insoles can reduce pain and improve ambulation. Lateral wedged insoles can be of symptomatic benefit for some patients with medial tibio-femoral compartment OA. 	<ol style="list-style-type: none"> 1. LoE IV SOR: 90% (95% CI 84-96) 2.LoE IA SOR: 76% (95% CI 69-83) 3. LoE IA SOR: 77% (95% CI 66-88)
Osteoarthritis (2008)	<ol style="list-style-type: none"> 1. Healthcare professionals should offer advice on appropriate footwear (including shock absorbing properties) as part of core treatment for people with lower limb osteoarthritis. 2. People with osteoarthritis who have biomechanical joint pain or instability should be considered for assessment for bracing/joint supports/insoles as an adjunct to their core treatment. 3. Assistive devices (for example, walking sticks and tap turners) should be considered as adjuncts to core treatment for people with OA who have specific problems with activities of daily living. Healthcare professionals may need to seek expert advice in this context (for example from occupational therapists or disability equipment assessment centres). 	?

Adaptations/Revision of Knee OA EB physiotherapy recommendations

Husam Dandees

Exercise

The composite recommendations were as follows:

- ❑ Composite recommendation : *Regular low impact aerobic exercises are effective for improving fitness, muscle strengthening and improving ROM in patients with knee OA.*
-

Exercise

- ❑ *Strategy 1: Exercise can be conducted effectively on land by patient with knee OA.*
 - ❑ *Strategy 2: Exercise can be conducted effectively in water by patients with knee OA.*
-

Exercise

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Land	A	A	B	A	A
Aquatic	B	C	B	A	A

Weight loss

The composite recommendations were as follows:

- ☐ Composite recommendation :
Overweight or obese individual should be encouraged to loss weight and maintain it at the lower level.
-

Weight loss

- *Strategy 1: weight should be maintained at the lower level with an appropriate program of dietary modification and exercise.*
 - *Strategy 2: 5 % minimum weight loss should be the aim.*
-

Weight loss

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Weight loss	A	A	B	A	A

SMEPs

The composite recommendations were as follows:

- ❑ Composite recommendation : *there is strong evidence to support participation in SMEP's*
 - ❑ Strategy : *SMEP's should be conducted by recognized service provider.*
-

SMEPs

- ❑ *Strategy 2: SMEP's should address self help, patient-driven, lifestyle changes, exercise and activity bracing.*
 - ❑ *Strategy 3: advice should be provided on pharmacological and non pharmacological therapies.*
-

SMEPs

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
SMEPs	A	A	C	A	A

Multimodal Physiotherapy

The composite recommendations were as follows:

- ❑ Composite recommendation :
Combination treatments (multimodal physiotherapy) are supported by modest evidence (3 level 2 studies).
-

Multimodal Physiotherapy

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Multimodal PT	C	C	C	A	A

Thermotherapy

The composite recommendations were as follows:

- ❑ *Composite recommendation : There is modest evidence to support the use of hot and cold therapy for symptom relief in patients with knee OA.*
-

Thermotherapy

- *Strategy 1: Applying ice massage for 20 min x 5 times per week for 2 weeks showed clinically significant improvement in quadriceps strength (ES = 1.03, 95% CI 0.44- 1.62) but had no statistically significant effect on ROM or walking (OARSI 2008).*
-

Thermotherapy

- *Whereas applying ice 3 times per week for 3 weeks showed some improvement on pain (Weighted Mean Difference, WMD -2.70 95% CI -5.52, 0.12). This effect was not statistically significant (Brosseau et al. 2003)*
-

Thermotherapy

- *Strategy 2: There is little evidence to support the use of short wave diathermy (SWD) and heat modalities. Results showed that the use of SWD and heat were not followed by any improvement in pain and there was no evidence of clinical effect after 3 weeks (Brosseau et al. 2003).*
-

Thermotherapy

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Thermotherapy	A	B	C	A	A

Electrotherapy

The recommendations for electrotherapy were as follows:

- Composite recommendation : *There is modest evidence to support the use of electrotherapy modalities for symptom relief particularly as adjunctive treatment to exercise in the management of knee OA.*
-

Electrotherapy

- Strategy 1: *TENS has modest evidence if used regularly for at least 4 weeks in the management of knee OA.*
 - Strategy 2: *there is weak evidence to support the use of low level LASER therapy as adjective therapy in the management of knee OA.*
-

Electrotherapy

- *Strategy 3: there is little evidence to support the use of US in the management of knee OA.*
- *Strategy 4: there is little evidence to support the use of electromagnetic field in the management of knee OA.*

Electrotherapy

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
TENS	C	C	C	A	A
US	C	C	C	A	A
LASER	C	C	C	B	A
SWD	C	C	D	B	A

Manual therapy

The composite recommendation was as follows:

- ❑ Composite recommendation : *manual therapy has modest evidence to manage symptoms of knee OA.*

Manual therapy

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Manual therapy	A	C	D	B	B

Massage

The composite recommendation was as follow:

- *Composite recommendation : There is weak evidence to support the use of massage in the management of knee OA.*
-

Massage

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Massage	D	NA	D	A	A

Acupuncture

The composite recommendation was as follows:

- Composite recommendation: *there is modest evidence for the use of acupuncture in the management of knee OA pain.*
-

Acupuncture

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Acupuncture	A	C	C	C	C

Taping

The composite recommendations were as follows:

- *Composite recommendation : There is modest evidence to support the use of patellar taping for short term relief of pain and improvement on function in knee OA*
-

Taping

- *Strategy : medial directed taping shows clinically important improvement in the short term when compared to sham taping and there are long term effects when compared to no taping*
-

Taping

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Patellar taping	A	C	C	B	B

Bracing

The composite recommendations were as follow:

- ❑ Composite recommendation : *there is moderate evidence for the use of assistive devices and other mechanism for unloading the joint in the management of knee OA.*
-

Bracing

- *Strategy 1: walking aids such as canes and crutches or frames (with or without wheels) have moderate evidence of effectiveness.*
 - *Strategy 2: there is weak evidence to support the use of knee braces to improve symptoms in knee OA.*
-

Bracing

- *Strategy 3: advice concerning appropriate foot wear should be recommended.*
 - *Strategy 4: there is little evidence to support the use of insoles for symptom relief. Lateral wedged insoles can be of symptomatic benefit for some patients with medial knee OA.*
-

Bracing

	Evidence base	Consistency	Clinical impact	Applicability	Generalisability
Crutches or frames	A	A	D	A	A
Knee brace	D	D	D	A	A
Foot wear	D	D	D	A	A
Insoles	D	D	D	A	A

Case studies (Research project)

H Dandees
 Stellenbosch University
 Physiotherapy Division

Objectives

- ☐ Ascertain whether the physiotherapists gained knowledge about the EB physiotherapeutic strategies for knee OA
 - ☐ To revise the information presented and revise the EB for physiotherapy knee OA interventions
-

Format of case study discussion

- ☐ Read the case description
 - ☐ Formulate 2 groups consisting of 5 physiotherapists each to discuss case study
 - Read case study
 - Discuss questions relating to each case
 - ☐ Both groups facilitated by researcher
-

Case study 1

- ☐ 57 years old male, office worker, suffered from ® knee OA for the past 3 years. Diagnosis was based on x-Ray
 - ☐ Main complaint: pain, morning stiffness
 - ☐ Main physical examination findings: limited ROM (-10,110),
-

Case study 2

- ☐ 66 female, diagnosed as Lt knee OA about 6 years
 - ☐ Main complaint: pain, stiffness and walking difficulty
 - ☐ Main physical examination findings
Weight 87 Kg, height 162Cm, VAS for pain 9/10, weak muscle (Oxford Scale knee ext=3+)
-

Discussion Points/Questions

- ☐ Discuss which outcome measurement tools will be appropriate.
 - ☐ Describe Physical and functional tests you will use in the assessment.
 - ☐ Discuss the priority physiotherapeutic techniques that will you administer to the patient.
 - ☐ Discuss the EB of the selected physiotherapeutic techniques.
-

Conclusion of case study

- ☐ Facilitator highlighted differences in approaches between the two groups
 - ☐ Facilitator revised the evidence matrix to consolidate understanding of the EB for interventions
-

Appendix 8: Ethics approval



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jou kennisvenoot • your knowledge partner

23 June 2011

MAILED

Mr H Dandess
Department of Physiotherapy
4th Floor
Teaching Block

Dear Mr Dandess

Evidence-based knee osteoarthritis physiotherapeutic management: A knowledge of translation study.

ETHICS REFERENCE NO: N11/03/102

RE : APPROVAL

A panel of the Health Research Ethics Committee reviewed this project on 18 April 2011; the above project was approved on condition that further information is submitted.

This information was supplied and the project was finally approved on 22 June 2011 for a period of one year from this date. This project is therefore now registered and you can proceed with the work.

Please quote the above-mentioned project number in ALL future correspondence.

Please note that a progress report (obtainable on the website of our Division: www.sun.ac.za/rds) should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly and subjected to an external audit. Translations of the consent document in the languages applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372

Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health (healthres@pgwc.gov.za Tel: +27 21 483 9907) and Dr Hélène Visser at City Health (Helene.Visser@capetown.gov.za Tel: +27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

Approval Date: 22 June 2011

Expiry Date: 22 June 2012

01 December 2011 10:00

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Yours faithfully

MS CARLI SAGER

RESEARCH DEVELOPMENT AND SUPPORT

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01 December 2011 10:00

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Appendix 9: Physiotherapy association ethics approval



نقابة العلاج الطبيعي الفلسطيني - القدس
PPTASS

نقابة العلاج الطبيعي الفلسطيني - القدس
Palestinian Physiotherapy Association – Jerusalem

Date :- 11.05.2011
No :- 18.08/2011

To whom it may concern


Ethical approval

This is to certify that the scientific committee Of the Palestinian physiotherapy association after discussion, granted Mr. Husam M Dandees from Jerusalem / Palestine, the ethical approval to conduct this research about

*"Evidence- Based knee osteoarthritis physiotherapeutic management:
A knowledge translation study "*

And that the association represented in its scientific committee will be responsible for his strict fulfill of his ethical commitments throughout the period of conduction of the above mentioned research .

*PPASS - Scientific committee
PPTASS President - Mohamned Amro*



www.pptass.com pptass@hotmail.com Mobile :- 0599256515

Appendix 10: Physiotherapists consent form

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM FOR PHYSIOTHERAPISTS
--

TITLE OF THE RESEARCH PROJECT:

Evidence-based knee osteoarthritis physiotherapeutic management: A knowledge translation study

Health Research Ethics Committee Number:

REFERENCE NUMBER: N11/03/102

PRINCIPAL INVESTIGATOR: Hussam Dandees (BSc. Physiotherapy)

ADDRESS: Jerusalem P.O BOX 20970

CONTACT NUMBER: 0546673008

You are invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how your patients' medical records could be involved. Also, your participation is entirely voluntary and you are free to decline to participate. You are also free to withdraw from the study at any point, even if you do initially agree to take part.

This study has been approved by the **Health Research Ethics Committee at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki.

What is this research study all about?

The aim of this research project is to translate the knowledge about the best evidence for knee osteoarthritis (OA) management to physiotherapists. Physiotherapists generally use a wide range of modalities to treat knee OA patients, irrespective of whether there is research evidence to support a specific modalities.. With this study we hope to translate the knowledge about the evidence of physiotherapeutic modalities to physiotherapists.

The aim of this study is to audit physiotherapy records of patients who received physiotherapy treatment for knee OA. The audit data will include patients and therapist demographics, the main examination findings, risks factors, number of treatment sessions, duration of the treatment episode and type of treatments delivered. The treatment data will be extracted and categorized into exercise, self management education, electrotherapy, manual techniques, weight loss and home programs.

The project also includes a workshop for physiotherapists on the evidence-base for knee OA physiotherapeutic modalities. The content of the workshop is based on a thorough, up to date review of the literature which was conducted by our research team. The study will take place at the selected practices and each visit will last about 3 hours.

Why have you been invited to participate?

You have been randomly selected from a list of physiotherapists which was obtained from the local physiotherapy association. Based on the information provided by the association, physiotherapists who regularly treat patients with knee OA were invited to participate.

What will your responsibilities be?

Your responsibility will be to identify patients who received physiotherapy for knee OA and to obtain permission from the patients to provide access of their physiotherapy records to this research team. You will also be requested to attend a workshop on evidence based management physiotherapy modalities on knee OA.

Will you benefit from taking part in this research?

Your participation will assist in the application of evidence based physiotherapeutic modalities in clinical practice.

Are there any risks involved in taking part in this research?

No, there are no risks involved.

Who will have access to your records/data?

All the information collected for this project will be treated as confidential and will be protected. If this information is used in a thesis or publication, the identity of participants will remain anonymous. Only the researcher and his team will have access to the information.

How long your records will be storied?

All records and consent forms will be locked up and stored for five years in the Physiotherapy Department, Stellenbosch University.

Will you be paid to take part in this study and are there any costs involved?

You will not be paid to take part in the study. There will be no costs involved for you if you do take part. All the records and data collected from the physiotherapists will be considered as confidential.

Is there anything else that you should know or do?

1. You can contact Hussam Dandeas at Cell: 0546673008 if you have any further queries or encounter any problems.
2. You will receive a copy of this information and consent form for your own records.

Consent of participant

By signing below, I (*name of participant*)agree to take part in a research study entitled "Evidence- Based knee osteoarthritis physiotherapeutic management: A knowledge translation study"

I declare that:

1. I have read or had read to me this information and consent form and that it is written in a language with which I am fluent and comfortable.
2. I have had a chance to ask questions and all my questions have been adequately answered.
3. I understand that taking part in this study is **voluntary** and I have not been pressurized to take part.
4. I may choose to withdraw from the study at any time and I will not be penalized or prejudiced in any way.
5. I allow the researcher to audit my patients' medical records as part of this research project.

Signed at (*place*) on (*date*) 2011.

Signature of participant

Signature of witness

Declaration by investigator

I (*name*) declare that:

1. I explained the information in this document to
2. I encouraged him/her to ask questions and took adequate time to answer them.
3. I am satisfied that he/she adequately understands all aspects of the research, as discussed

above

4. I did/did not use a translator (if a translator is used, then the translator must sign the declaration below).

Signed at (*place*) on (*date*) 2011

Signature of investigator

Signature of witness

Declaration by translator

I (*name*) declare that:

1. I assisted the investigator (name) to explain the information in this document to (name of participant) using the language medium of Arabic/Hebrew.
2. We encouraged him/her to ask questions and took adequate time to answer them.
3. I conveyed a factually correct version of what was related to me.
4. I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her questions satisfactorily answered.

Signed at (*place*) on (*date*) 2011.

Signature of translator

Signature of witness

Appendix 11: Informed consent for post-intervention group (Arabic)

عنوان مشروع البحث :

العلاج الطبيعي المبني على الادلة لمرضى التهاب المفاصل في مفصل الركبة: ترجمة المعارف

رقم لجنة اخلاقيات البحث الطبي:

الرقم المرجعي: 102-03-11

الباحث الرئيسي: حسام دنديس (بكالوريوس علاج طبيعي)

العنوان : القدس صندوق بريد 20970

رقم الهاتف : 0546673008

انتم مدعوون للمشاركة في مشروع بحثي. يرجى أن تأخذ بعض الوقت لقراءة المعلومات المقدمة هنا ، والتي تشرح تفاصيل هذا المشروع تماما. و يرجى سؤال فريق البحث أي أسئلة عن أي جزء من هذا المشروع. من المهم جدا ان تكون راضيا تماما وأن تفهم بوضوح ما يستتبع هذا البحث ، وكيف يمكن إشراك سجلك الطبي. مشاركتم طوعية تماما أيضا ، وأنت حر في أن ترفض المشاركة ، وهذا لن يؤثر عليك أو جلسة العلاج سلبا بأي شكل من الأشكال. أنت أيضا حر في الانسحاب من الدراسة في أي لحظة ، حتى لو وافقت مبدئيا على المشاركة.

قد اعتمدت هذه الدراسة من قبل لجنة الصحة أخلاقيات البحوث في جامعة ستيلينبوش ، وسوف تجري وفقا للمبادئ التوجيهية الأخلاقية ومبادئ الإعلان العالمي لهلسنكي.

ما هي هذه الدراسة البحثية حول ؟

الهدف من هذا المشروع البحثي هو دراسة نوعية تدخل العلاج الطبيعي لمرضى التهاب العظم والمفاصل في الركبة ، وتوفير العلاج الطبيعي مع أفضل الأدلة المتاحة لتحسين الخيارات العلاجية لمرضى التهاب العظم والمفاصل في الركبة.

لماذا دعيت إلى المشاركة؟

دعيت للمشاركة في هذا المشروع البحثي لانك عولجت كمرضى لالتهاب المفاصل في الركبة خلال ال 3 أشهر السابقة من قبل أخصائي العلاج الطبيعي الذي وافق على المشاركة في هذه الدراسة البحثية.

ما هي مسؤولياتك ؟

مسؤوليتك هي فقط إعطاء الموافقة يجب عليك الموافقة على المشاركة في الدراسة. وسوف يقوم الباحث بمراجعة

سجلك الطبي.البيانات المراجعة ستشمل بيانات المريض الديموغرافية (العمر ، الجنس ، الوضع العائلي ، والوزن) ، ونتائج الفحص الرئيسية ، وعوامل المخاطر ، وعدد من جلسات العلاج ، ومدة الجلسة العلاجية ونوعية العلاجات المقدمة.

من لديهم إمكانية الوصول إلى السجلات الخاصة بك؟

ستعامل جميع المعلومات التي تم جمعها مع هذا المشروع على أنها سرية ، وسوف تكون محمية. إذا تم استخدام هذه المعلومات في الرسالة أو نشر ، نضمن عدم الكشف عن هوية المشاركين. فقط الباحث وفريقه سوف يتمكنون من الوصول إلى المعلومات. وستبقى هذه السجلات بشكل آمن في إدارة العلاج الطبيعي ، جامعة ستيلينبوش ، جنوب أفريقيا.

متى سيتم تدمير السجلات الخاصة بك؟

سيتم تدمير السجلات بعد خمس سنوات .

هل سوف يكون هنالك مردود مالي للمشاركة في هذه الدراسة وهل هناك أي التكاليف للمشاركة؟
أنت لن تدفع للمشاركة في الدراسة. لن يكون هناك أي التكاليف التي ينطوي عليها بالنسبة لك إذا كنت لا تأخذ جزءا.

هل هناك أي مخاطر في المشاركة في هذا البحث؟

هناك الحد الأدنى من المخاطر التي ينطوي عليها المشاركة في هذا المشروع البحثي.

هل هناك أي شيء آخر يجب أن تعرفه

1 يمكنك الاتصال حسام دنديس خليوي : 0546673008 إذا كان لديك أي استفسارات أخرى أو واجهتك أية مشاكل.

2 سوف تتلقى نسخة من هذه المعلومات واستمارة الموافقة على كشف السجلات الخاصة بك.

موافقة مشارك

بالتوقيع أدناه ، أنا (اسم المشارك)..... اوافق على المشاركة في دراسة بحثية بعنوان "الأدلة المستندة إلى إدارة الركبة هشاشة العظام العلاج الطبيعي : ترجمة المعارف دراسة "

أعلن ما يلي :

1. لقد قرأت أو قد قرأ لي هذه المعلومات واستمارة الموافقة و هي مكتوب في اللغة التي افهمها أنا بطلاقة ومريحة.
2. قد أتيت لي فرصة لطرح الأسئلة ولقد تمت الإجابة على جميع أسئلتني بشكل كاف.
3. أنا أفهم أن من يشارك في هذه الدراسة هو طوعي وأنا لم يضغط علي لاشراك.
4. الانسحاب من الدراسة في أي وقت ممكن ،لا يوجد مانع من الانسحاب في اي وقت .
5. أسمح للباحث بمراجعة السجلات الطبية لدي كجزء من هذا المشروع البحثي.

وقعت في (مكان)..... في (التاريخ)..... 2011

توقيع الشاهد

توقيع المشارك

إعلان من قبل المحقق

أنا (الاسم)..... اعلن ما يلي :

- وأوضح أنا ان المعلومات الواردة في هذا المستند إلى.....
- اعطي له / لها الفرصة لطرح الأسئلة وأخذ الوقت الكافي للرد عليها.
- أنا مقتنع بأنه / ها فهم بشكل كاف جميع جوانب البحث ، كما نوقش أعلاه

وقعت في (مكان)..... في (التاريخ)..... 2011

Appendix 12: Patients consent per-intervention (English)

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM FOR KNEE OA PATIENTS
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TITLE OF THE RESEARCH PROJECT:

Evidence- Based knee osteoarthritis physiotherapeutic management: A knowledge translation study

Health Research Ethics Committee Number:

REFERENCE NUMBER: N11/03/102

PRINCIPAL INVESTIGATOR: Hussam Dandees (BSc. Physiotherapy)

ADDRESS: Jerusalem P.O BOX 20970

CONTACT NUMBER: 0546673008

You are invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the research staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how your medical record could be involved. Also, your participation is entirely voluntary and you are free to decline to participate. If you say no, this will not affect you or your treatment session negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do initially agree to take part.

This study has been approved by the **Health Research Ethics Committee at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki. This research will take place in Jerusalem and you will be interviewed for one time only.

What is this research study all about?

The aim of this research project is ascertain what type of physiotherapy interventions are commonly used to treat knee OA patients. The study involves an audit of your physiotherapy record and this will take place at the selected practices.

Why have you been invited to participate?

You have been invited to participate in this research project since you have been treated for knee osteoarthritis in the previous 3 months by a physiotherapist who agreed to participate in this research study. You have also given your physiotherapist permission to provide your name and contact details to the researcher.

What will your responsibilities be?

Your responsibility is only to provide consent should you agree to participate in the study. The researcher will audit your physiotherapy record. The audit data will include patient demographics (age, gender, marital status, weight, etc.), the main examination findings, risks factors, number of treatment sessions, duration of the treatment episode and type of treatments delivered.

Who will have access to your records?

All the information collected for this project will be treated confidential and will be protected. If this information is used in a thesis or publication, the identity of participants will remain anonymous. Only the researcher and his/her team will have access to the information. The records will be kept safely in the Physiotherapy Department, Stellenbosch University, South Africa.

How long your records will be stored?

All records and consent forms will be locked up and stored for five years in the Physiotherapy Department, Stellenbosch University, South Africa.

Will you be paid to take part in this study and are there any costs involved?

You will not be paid to take part in the study. There will be no costs involved for you if you do take part.

Are there any risks involved in taking part in this research?

There are minimal risks involved in participating in this research project.

Is there anything else that you should know or do?

1. You can contact Hussam Dandees at cell: 0546673008 if you have any further queries or encounter any problems.
2. You will receive a copy of this information and consent form for your own records.

Consent of participant

By signing below, I (*name of participant*)agree to take part in a research study entitled” Evidence- Based knee osteoarthritis physiotherapeutic management: A knowledge translation study”

I declare that:

1. I have read or had read to me this information and consent form and that it is written in a language with which I am fluent and comfortable.

2. I have had a chance to ask questions and all my questions have been adequately answered.
3. I understand that taking part in this study is **voluntary** and I have not been pressurized to take part.
4. I may choose to withdraw from the study at any time and I will not be penalized or prejudiced in any way.
5. I allow the researcher to audit my medical records as part of this research project.

Signed at (*place*) on (*date*) 2011.

Signature of Participant

Signature of witness

Declaration by investigator

I (*name*) declare that:

1. I explained the information in this document to
2. I encouraged him/her to ask questions and took adequate time to answer them.
3. I am satisfied that he/she adequately understands all aspects of the research, as discussed above
4. I did/did not use a translator (*if a translator is used, then the translator must sign the declaration below*).

Signed at (*place*) on (*date*) 2011.

Signature of investigator

Signature of witness

Declaration by translator

I (*name*) declare that:

1. I assisted the investigator (*name*) to explain the information in this document to (*name of participant*) using the language medium of Arabic/Hebrew.
2. We encouraged him/her to ask questions and took adequate time to answer them.

3. I conveyed a factually correct version of what was related to me.
4. I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her questions satisfactorily answered.

Signed at (*place*) on (*date*) 2011.

Signature of translator

Signature of witness

Appendix 13: Patients consent post-intervention (English)

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM FOR KNEE OA PATIENTS: After the educational workshop.

TITLE OF THE RESEARCH PROJECT:

Evidence- Based knee osteoarthritis physiotherapeutic management: A knowledge translation study

Health Research Ethics Committee Number:

REFERENCE NUMBER: N11/03/102

PRINCIPAL INVESTIGATOR: Hussam Dandees (BSc. Physiotherapy)

ADDRESS: Jerusalem P.O BOX 20970

CONTACT NUMBER: 0546673008

You are invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the research staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how your medical record could be involved. Also, your participation is entirely voluntary and you are free to decline to participate. If you say no, this will not affect you or your treatment session negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do initially agree to take part.

This study has been approved by the **Health Research Ethics Committee at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki. This research will take place in Jerusalem and you will be interviewed for once only.

What is this research study all about?

The aim of this research project is ascertain what type of physiotherapy interventions are commonly used to treat knee OA patients after participating in evidence based workshop. The study involves an audit of your physiotherapy record and this will take place at the selected practices.

Why have you been invited to participate?

You have been invited to participate in this research project since you have been treated for knee osteoarthritis in the previous 3 months by a physiotherapist who agreed to participate in this research study. Your physiotherapist participated in evidence based knee osteoarthritis physiotherapeutic management

workshop. You have also given your physiotherapist permission to provide your name and contact details to the researcher.

What will your responsibilities be?

Your responsibility is only to provide consent should you agree to participate in the study. The researcher will audit your physiotherapy record. The audit data will include patient demographics (Age, Gender, marital status, weight), the main examination findings, risks factors, number of treatment sessions, duration of the treatment episode and type of treatments delivered.

Who will have access to your records?

All the information collected for this project will be treated as confidential and will be protected. If this information is used in a thesis or publication, the identity of participants will remain anonymous. Only the researcher and her team will have access to the information. The records will be kept safely in the Physiotherapy Department, Stellenbosch University, South Africa.

How long your records will be stored?

All records and consent forms will be locked up and stored for five years in the Physiotherapy Department, Stellenbosch University.

Will you be paid to take part in this study and are there any costs involved?

You will not be paid to take part in the study. There will be no costs involved for you if you do take part.

Are there any risks involved in taking part in this research?

There are minimal risks involved in participating in this research project.

Is there anything else that you should know or do?

- 1 You can contact Hussam Dandees at cell: 0546673008 if you have any further queries or encounter any problems.
- 2 You will receive a copy of this information and consent form for your own records.

Consent of participant

By signing below, I (*name of participant*)agree to take part in a research study entitled” Evidence- Based knee osteoarthritis physiotherapeutic management: A knowledge translation study”

I declare that:

1. I have read or had read to me this information and consent form and that it is written in a language with which I am fluent and comfortable.
2. I have had a chance to ask questions and all my questions have been adequately answered.
3. I understand that taking part in this study is **voluntary** and I have not been pressurized to take part.
4. I may choose to withdraw from the study at any time and I will not be penalized or prejudiced in any way.
5. I will allow the researcher to audit my medical records as part of this research project.

Signed at (*place*) On (*date*) 2011.

Signature of participant

Signature of witness

Declaration by investigator

I (*name*) declare that:

1. I explained the information in this document to
2. I encouraged him/her to ask questions and took adequate time to answer them.
3. I am satisfied that he/she adequately understands all aspects of the research, as discussed above.
4. I did/did not use a translator (if a translator is used, then the translator must sign the declaration below).

Signed at (*place*) On (*date*) 2011.

Signature of investigator

Signature of witness

Declaration by translator

I (*name*) declare that:

1. I assisted the investigator (name) to explain the

information in this document to (name of participant) using
the language medium of Arabic/Hebrew.

2. We encouraged him/her to ask questions and took adequate time to answer them.
3. I conveyed a factually correct version of what was related to me.
4. I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her questions satisfactorily answered.

Signed at (*place*) on (*date*) 2011.

Signature of translator

Signature of witness